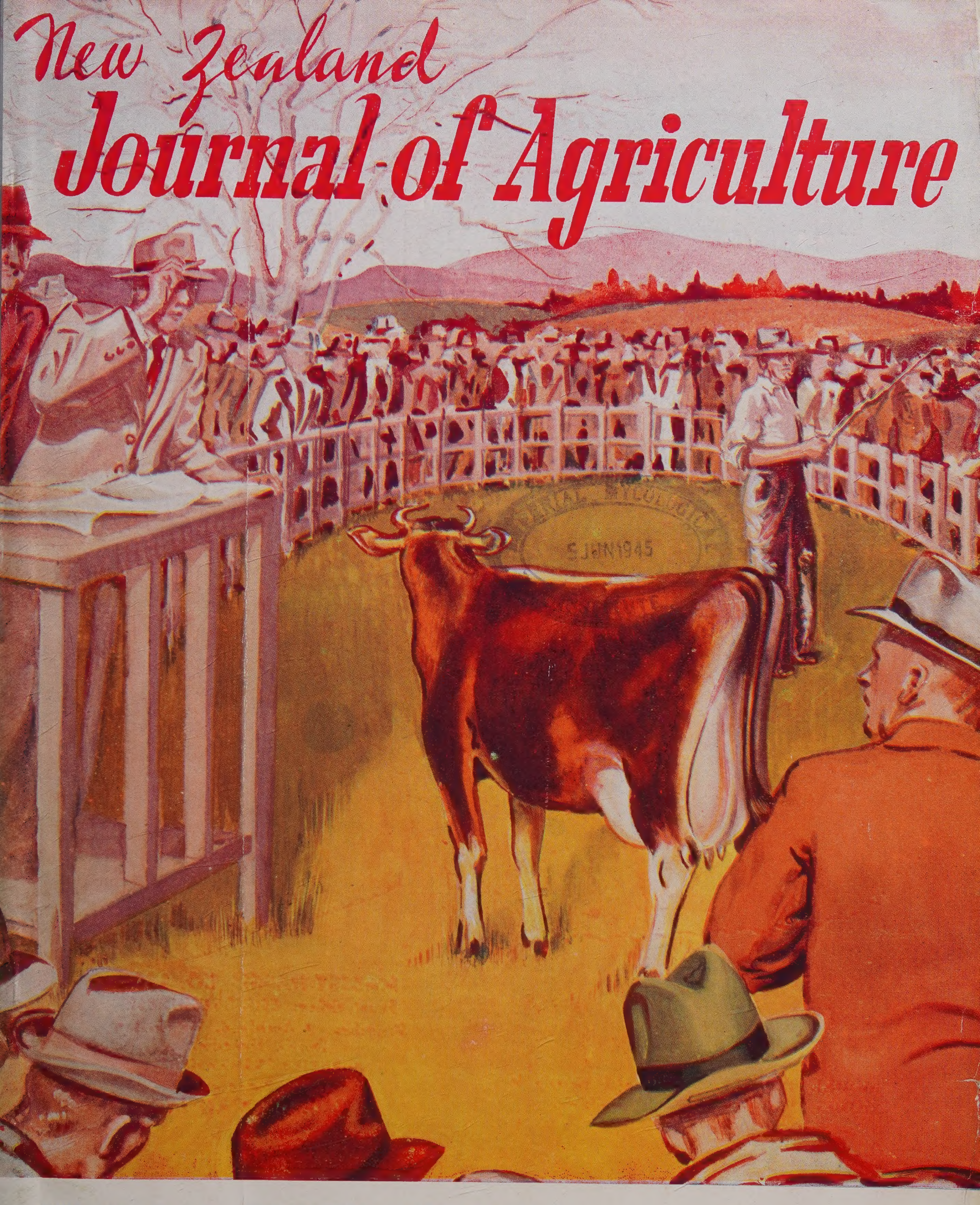
New Zealand Journal of Agriculture



5 JUN 1945

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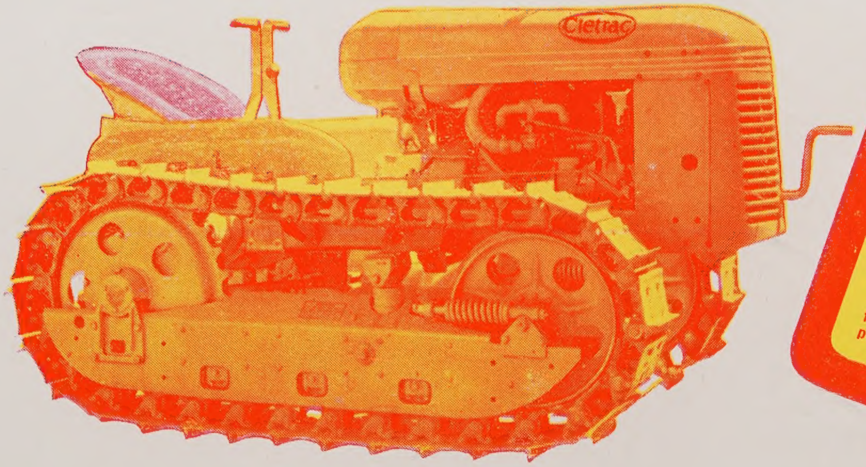

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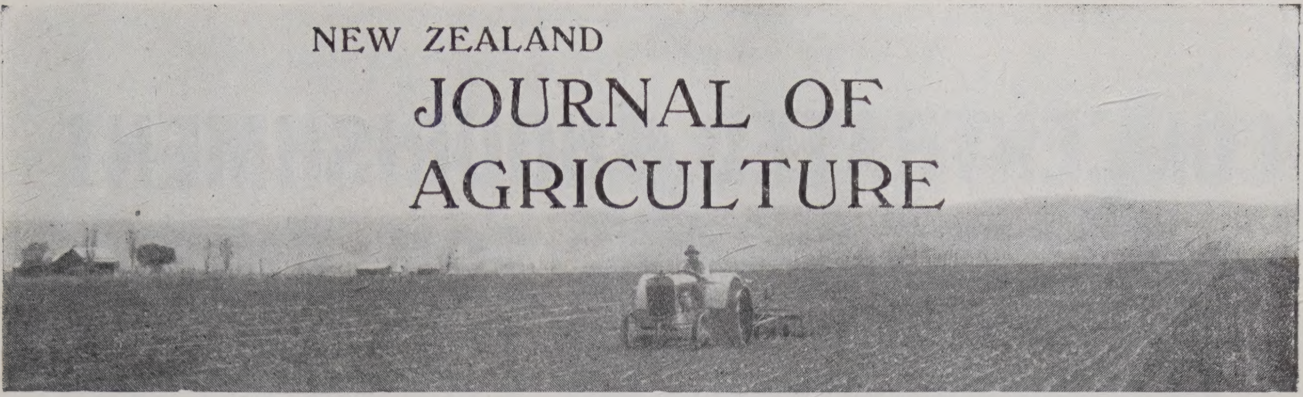

NEW ZEALAND
JOURNAL OF
AGRICULTURE

Vol. 70, No. 4. Published by Direction of Hon. B. Roberts, Minister of Agriculture. April 16, 1945.

National Pig Industry Council Reviews Pig Production

Why Home-grown Crops are Vital

UNPLEASANT facts are hard to face, but we must face them. Pig killings have fallen off, and while the number of baconers slaughtered has been increased, there is still a grave reduction in the tonnage of pig-meat produced. We have the facilities to expand past our previous best. If we don't, the supplies of pig-meat to the Armed Forces in the Pacific cannot be maintained.

A PERUSAL of the official slaughtering figures published in the "Journal of Agriculture" shows a sad state of affairs in the one industry that should have gone ahead in New Zealand. No effort has been spared to encourage production. Prices were never better, and progressive increases in the schedule have been made over the past two years. The weight-range for bacon pigs has been raised to 200lb., imported stock feeds have been subsidised to keep prices to pig producers at an economic level, increased winter price schedules have been introduced, and last but not the least of these advantages is the £5 per acre crop subsidy scheme recommended by the National Pig Industry Council to ensure adequate winter feed supplies for pigs.

Nevertheless, pig killings have fallen off each year since 1941, and are continuing to do so. The accompanying table shows the total killings in export and rural slaughterhouses, abattoirs, and on farms month by month since January, 1941.

There is little doubt that some of the falling-off in production is bound up with the reduction of cows milked, which in turn is due mainly to a decrease in the amount of labour available. It is probable, also, that the general prosperity of the community as a whole has been a contributory factor.

Our goal is to provide as much foodstuffs as possible, and to achieve the 1945-46 target of 50,000 tons of pig-meat killings will have to increase by 200,000 pigs. This can be easily accomplished with the present breeding stock by increasing the annual production of pigs per sow from 8.2 as at present to 10.5, the 1941 level.

	1941.	1942.	1943.	1944.
January ..	127,918	106,869	103,407	108,182
February ..	105,241	119,864	99,256	95,655
March ..	154,091	137,289	120,146	90,548
April ..	142,674	108,073	98,748	56,055
May	112,566	98,143	50,865	107,314
June ..	41,047	35,356	33,682	43,683
July ..	23,065	21,755	14,304	12,170
August ..	25,990	17,580	13,804	12,288
September .	36,801	25,207	27,573	21,807
October ..	63,130	46,357	48,615	24,042
November .	87,348	75,555	62,609	65,968
December ..	105,368	89,047	81,697	67,624
Totals ..	1,025,239	881,095	754,706	705,336
Fall ..		144,144	126,389	49,370

Drop in production in three years—319,903 carcasses.

Wintering of Pigs the Solution

The basis of increased production, apart from more pigs per sow, lies in the wintering of a greater number, and this involves the provision of a feed supply for the maintenance of pigs when supplies of dairy by-products are not available. The shortage of a basic feed in winter makes feeding difficult enough at any time, but when winter shortage is contrasted with summer abundance of milk the wintering of pigs appears a real hardship.

While these facts are appreciated, increased production can come only by having sufficient pigs on hand to utilise to the fullest extent the supplies of milk as they become available.

Most people when asked how many pigs are wintered put the figure at one-sixth or one-eighth of the number slaughtered for the season, but careful estimates based on monthly killings make it clear that the number wintered is at least half that slaughtered in any one season, and therefore the amount of feed required in winter is slightly more than half that used in the peak months of the year. Because of our inability to obtain stock feeds from

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District.	No. of Applications.	Acres in—													Total Acreage.
		Carrots	Kumikumi.	Pumpkin.	Piemelon.	Barley.	Sugar beet.	Silver beet.	Mangolds.	Swedes.	Artichokes.	Chou moellier.	Peas.	Maize.	
Northland ..	352	67¼	51¾	151½	¾	8	11	36¾	13	959	42½	71	11½	491¾	1,915¾
Auckland ..	494	39½	93½	144½	1	12	40¼	7	30	952	29½	73	19½	580	2,021¾
Waikato ..	1,056	273½	496¾	213	5¾	243½	82½	4¼	39½	2,172	115½	320½	52¼	648¼	4,667¼
Bay of Plenty ..	747	166	716	269½	¼	57¾	38¼	—	17¾	1,028	233½	113½	13	1,837¼	4,490¾
Tairawhiti ..	325	26¾	85¼	371½	2	90½	59¾	2¼	37¾	60	9¼	36¼	1½	532	1,314¾
Taranaki ..	662	110½	17¾	21¾	½	85¾	125½	10	43¼	1,098¼	47½	284	59¾	53½	1,958
Wellington ..	605	63	½	11½	—	526	155½	4¼	107½	723¾	8½	390¼	208	25	2,223¾
Canterbury ..	288	23¾	—	5	—	631¼	19¼	16½	89½	392½	23¾	83¾	188¾	9	1,488¼
Otago-Southland	109	7½	—	—	—	281	6¾	—	48	279¼	9	42¾	33½	—	707¾
New Zealand ..	4,633	777¾	1,461½	1,188¼	10¼	1,935¾	538¾	81	426½	7,664¾	519	1,415	587¾	4,176¾	20,783

overseas, this extra feed must now consist of home-grown crops, for which the subsidy scheme was introduced.

Crop Subsidy Scheme

The £5 per acre subsidy for winter pig feed has been accorded a very mixed reception. Many producers were of opinion that it would have been better to have given encouragement by the more direct action of a rise in the price schedule. The Government policy in regard to the price of pig-meats was governed in general by stabilisation regulations, and, as will now be realised, had such a course been taken there still could have been no improvement in the stock feed position, and producers could not have taken advantage of any increase in prices when stock feeds for winter feeding were unattainable.

Viewed in another light, the crop subsidy scheme was, in effect, both a means of increasing the much-needed home-grown supplies of stock feeds and an indirect subsidy on production. The scheme is virtually a bonus of 10/- for every pig carried through the winter, and, as a sow to farrow before July 31 counts as seven pigs, a bonus of £3 10s. in the case of sows expected to farrow or with litters.

Many producers were quick to grasp the advantages of a crop subsidy, as is shown by the fact that more than 4,500 producers have made claims under the scheme, involving some 21,000 acres of mixed crops.

It is of importance, too, that more than one-third of this area comprises grain crops—barley, maize, and peas—which represents between 8,000 and 9,000 tons of high-quality feed. While still far short of our requirements, these grain crops give balance to the total crops grown, which make provision for about 200,000 pigs—about half the pigs which it is expected will have to be carried. Applications under the crop subsidy scheme have been extended to April 1, and the present position giving the number of applications submitted, the kind of crop grown, and the acreage involved in each District Pig Council's area is shown in the accompanying table.

Pigs to be Wintered

Some idea of the manner in which crops have been provided is indicated by the estimated number of pigs produced in each council's area and the number it is expected will be carried through the winter. These calculations are based on the sows held (83,000) as at January, 1944, as against the estimated slaughterings of pigs (680,000) for the season ended March, 1945, and give a basis of 8.2 pigs per sow slaughtered.

District Pig Council.	No. of Sows.	Pigs Produced.	Pigs to be Wintered.
North Island:			
Northland ..	10,800	88,600	58,000
Auckland ..	11,300	92,700	61,000
Bay of Plenty	10,500	86,100	57,000
Waikato ..	18,000	147,600	94,000
Taranaki ..	8,800	72,100	42,000
Gisborne ..	3,400	27,800	17,000
Wellington ..	10,100	82,800	54,000
	72,900	597,700	383,000
South Island:			
Canterbury .	8,000	65,600	40,000
Otago and Southland .	2,100	17,300	10,000
	10,100	82,900	50,000
Totals ..	83,000	680,600	433,000

The number of pigs to be carried through the winter should not be less than one-third of the total pigs produced in any one season in addition to all the breeding stock.

If it is assumed that only half the sows farrow between April and July, with an average of five pigs per litter (it has been shown that the average per sow is 8.2 slaughtered), then the pigs on hand from this source alone will be 207,500. Breeding stock, sows and boars, add another 100,000, giving a total of 307,500, which can be considered conservative. In addition, other pigs carried cannot be fewer than the number slaughtered between June and November—100,000 pigs—putting the grand total of pigs wintered at 407,500.

Feed Requirements

It can be estimated that the feed requirements of all pigs will be not less than 4lb. per pig per day for a period of 120 days. Of this, one-third may be provided by the diminishing milk supply, grass, and concentrates such as meat-meal, surplus grains, and grain offals. As there is no importation of stock feeds these must be provided by home-grown crops. To be self-supporting this would require the growing of crops providing 65,000 tons of grain equivalent feed.

How far has the crop subsidy scheme gone towards making this possible? Of the 21,000 acres claimed for, 14,300 acres are roots and 6,700 acres grain. Roots can be estimated to yield 30 tons of roots per acre, equal to 3 tons of grain equivalent feed. Other cereal crops are estimated to yield 1¼ tons of grain per acre. Roots, then, provide 43,000 tons of grain equivalent, and cereals 8,400 tons, a total of 51,400 tons grain equivalent. This, of course, is a great effort, but its economic use depends upon its equitable distribution throughout New Zealand.

There are 40,000 pig producers, of which only 24,000 carry breeding stock, but as only 4,600 producers have made application for the crop subsidy, it would appear that unless other arrangements have been made, apart from producers who have milk throughout the year, many pigs will go hungry this winter. Nevertheless, in spite of the apparent gloomy outlook for winter pig feed, producers have responded well to the crop subsidy scheme, particularly in view of the short notice given them to make preparations.

There is no doubt that more pigs have to be wintered if production is to be increased. Bring those you have through the winter without loss and make preparations NOW for ¼ acre of roots per sow and extra acres of grain crop to winter more pigs next year. Mate all available sows. Increase the output of pigs from 8.2 per sow to 10.5, as has been done in the past. These are methods of increasing production without seriously disrupting usual farming procedure. It is estimated that 83,000 sows can produce 900,000 pigs, and by carrying three-quarters of these to bacon weights our target of 50,000 tons of pig-meat for 1945-46 is a definite possibility.

"PIGS FOR PROFIT."

Pig farmers will find much practical information of value in Bulletin No. 212, "Pigs for Profit." This bulletin is free and is available from the Department of Agriculture, Auckland, Wellington, Christchurch and Dunedin.

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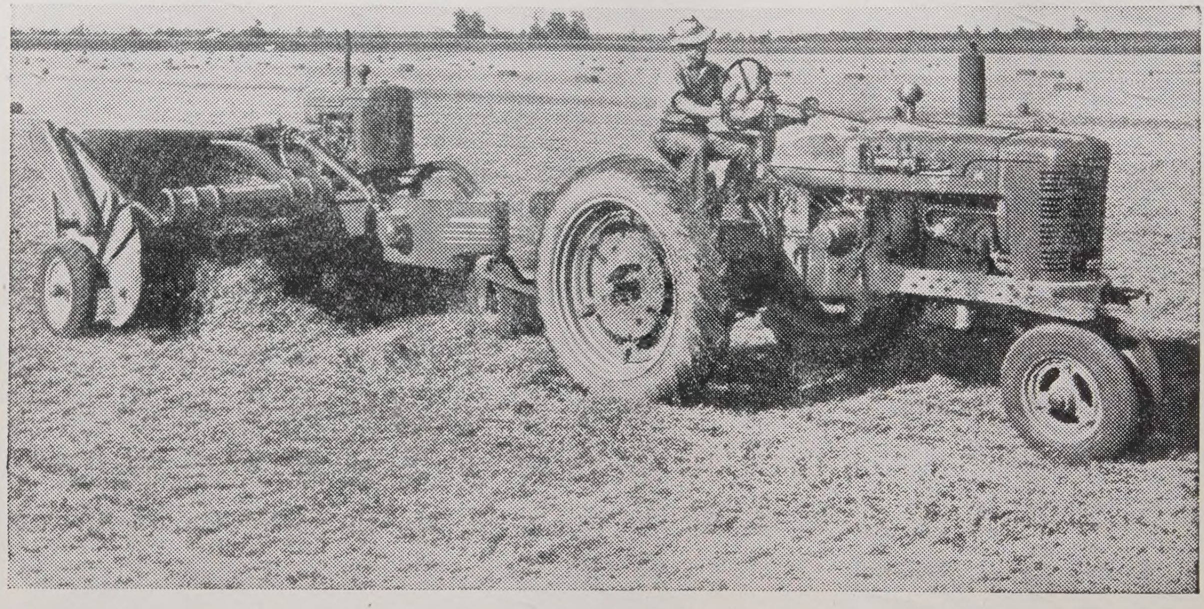

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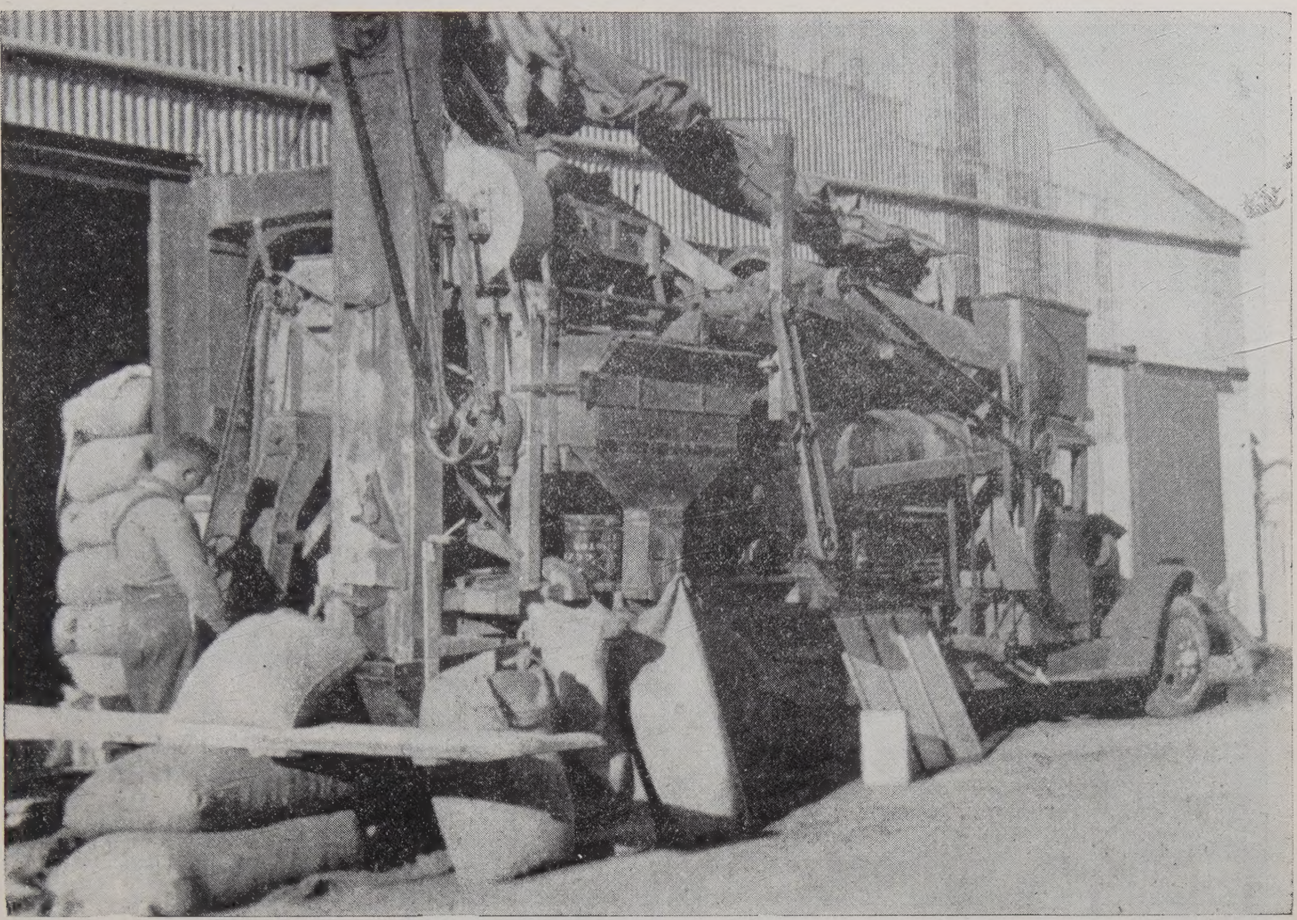


Machine Dressing of Certified Seed on the Farm

By G. K. McPHERSON, Instructor in Agriculture, Ashburton.

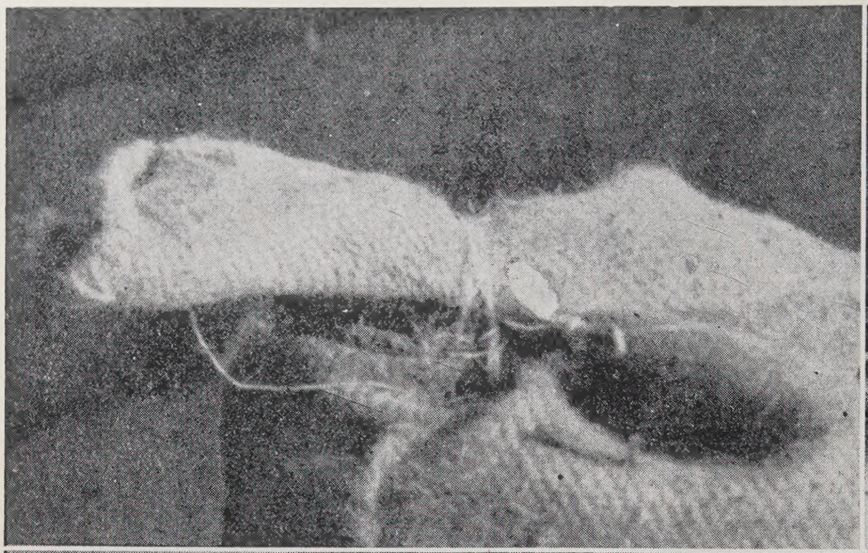
EVERY season a considerable quantity of the perennial ryegrass seed dressed on the farm by travelling dressing plants comes into one or other of the mercantile firms, and is eventually entered for certification in the Permanent Pasture class. Originally, travelling plants were designed with the primary object of dressing lines of seed on the farm for the farmer's own use, and in this connection they have performed and are performing a very useful service. During the past few years, however, the production of certified seeds has increased enormously, and travelling plants are now being called upon to dress seed, not only for the purpose mentioned above, but also for sale purposes and for export.

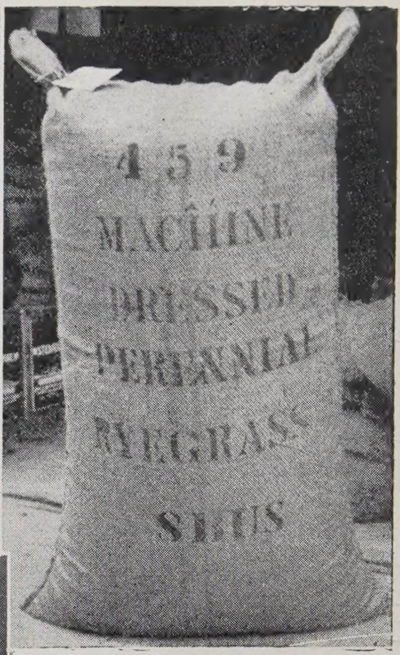
THIS necessitates not only a high uniform standard of purity in the dressed article, but also the bagging of the seed in suitably-branded, attractive sacks. In general, the standard of the work done by travelling plants is quite good, but unfortunately lines of seed which are most unsatisfactory at times do come into store. In order to obviate this position and improve the standard and appearance of seed offered for certification, it is necessary to obtain the co-operation and the assistance of both the plant operators and the farmers who utilise these plants. The main factors to which attention could be given with a view to improvement of the standard of the seed dressed on the farm are as follows:—

1. Quality of Sacks

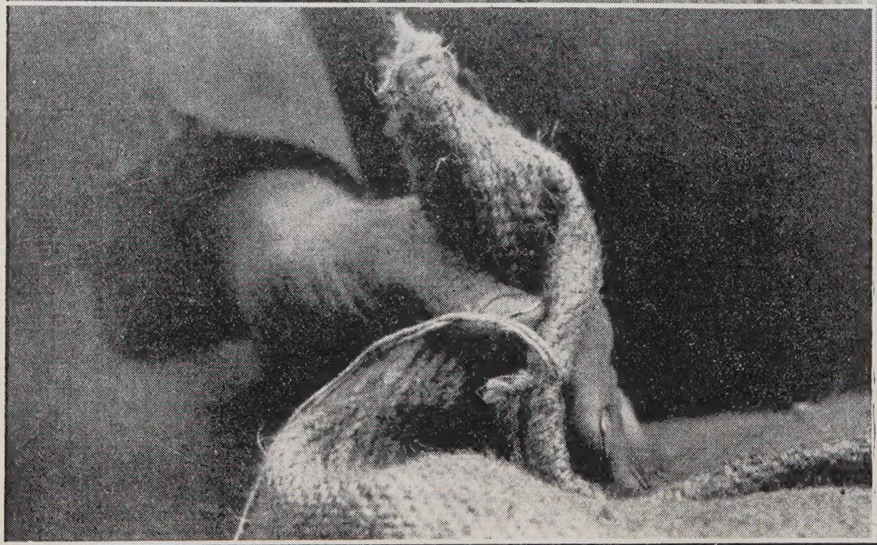
Seed to be eligible for certification must be bagged in either new sacks or good, clean second-hand sacks. For some years now some farmers have sent dressed seed into store bagged in old sacks, dirty sacks, sacks with holes in them, or sacks with a various assortment of ink brands on them. In the past such lines, if accepted for certification, have had to be rebagged before tagging and sealing. Owing to the work involved, however, it is not intended to rebag any further lines of seed in the Ashburton district. In future only those lines of grass seed which have been bagged in new sacks or good, sound second-hand sacks will be sampled for certification purposes.

Any lines which come into store in sacks which do not comply with the standard mentioned will not be sampled until the farmers concerned have made arrangements to have the lines rebagged. When seed,





4 5 9
MACHINE
DRESSED
PERENNIAL
RYEGRASS
8 BUS

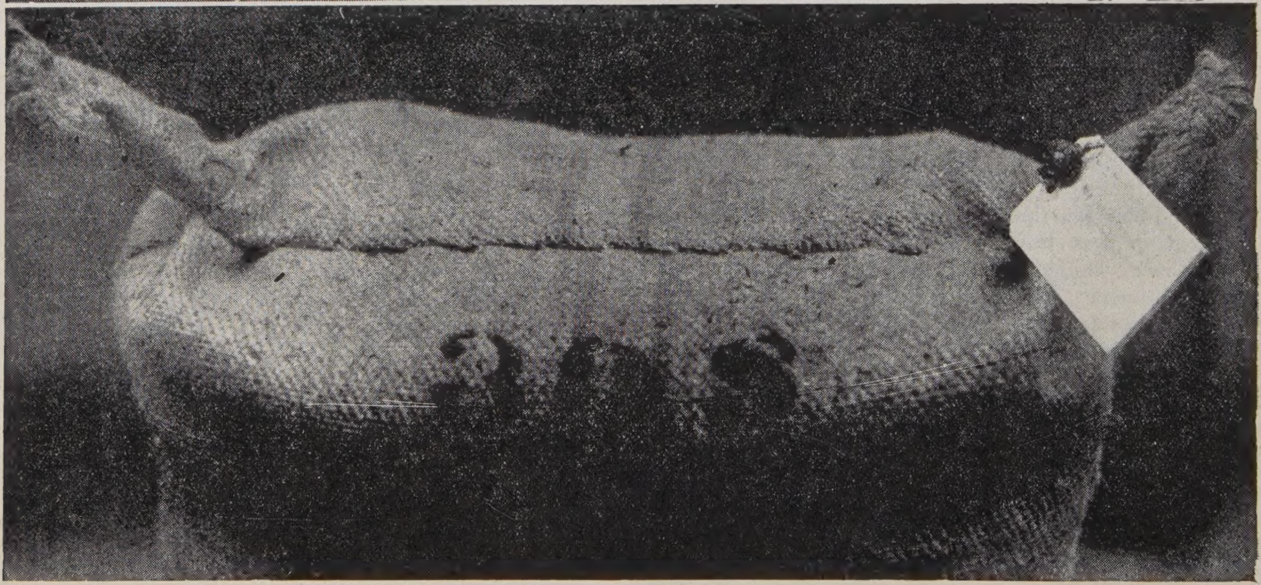


Upper left.—Sack incorrectly sewn; knot must not be exposed.

Middle.—Method of sewing to conceal knot.

Bottom.—Sack correctly sewn.

Upper right.—Sack correctly branded.



which will later be entered for certification, is being dressed on the farm it will therefore be in the farmer's interests to provide the plant operator with suitable sacks in order to avoid the necessity of rebagging.

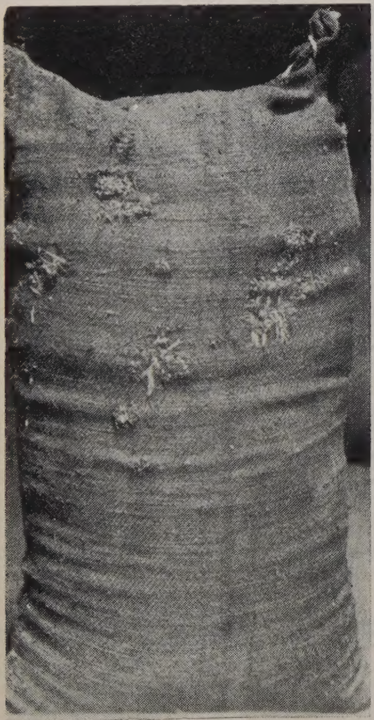
2. *Sewing of Sacks*

The incorrect sewing of sacks should be brought to the notice of travelling plant operators. In the past hundreds of sacks of perennial ryegrass dressed by travelling plants have had to be resown because the stitching did not comply with the certification regulations. In the future all sacks must be correctly sewn before they will be sampled for certification purposes. In the first place it is necessary with certified seed to ensure that the knot on the twine is properly buried in the fold of the sack, and secondly it is not permissible to have any knots on the twine throughout the stitching. It may be added here that lines of seed passed for certification must have a tag and seal attached to the free end of the twine. Farmers must ensure, therefore, that sufficient length is left at the free end of the twine for this to be done.

Patched sacks are unsuitable for certified seed.

3. *Presence of Weed Seeds*

If second-hand sacks are being used, they should be carefully examined to ensure that there are no weed seeds, such as hair grass or trefoil, adhering to the insides of the sacks. The insides of sacks of some lines of perennial ryegrass dressed on farms and entered for certification have been simply coated with a mat of hair grass. Lines stored in such sacks have had to be redressed and put into fresh sacks.



Sacks with holes or holes patched with binder twine are unsuitable for certified seed.

4. *Branding of Sacks*

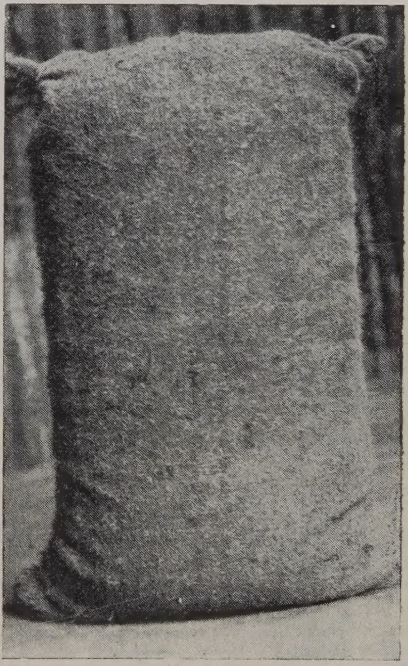
When dressing perennial ryegrass intended for entry into certification it would be an advantage and would add to the attractiveness of the line if the sacks could be branded or stencilled with the words "M/D perennial ryegrass."

5. *Weight of Sacks*

There have been considerable variations in the weights of individual sacks of lines dressed on farms. This is a drawback when seed is being marketed, and all sacks should contain the same weight of seed. Overfilling of sacks should also be avoided. Lines occasionally come into store with the sacks sewn without any overlap.

6. *Dressing of Seed*

Certification not only necessitates seed of a reasonable standard of purity, but it also demands that the dressed seed be of an even blend throughout. Frequently, however, farmers send into stores lines of seed in which there is considerable variation. Possibly sacks of dressed seeds, from different areas and of different purity standards, may become mixed on the farm after dressing, or the variation may be due to the inclusion of the redressed seconds in the main line. It is important that lines of seed from different areas of the farm should be kept apart and entered for certification as separate lines, or, alternatively, that the lines should be thoroughly blended so as to give an even standard of quality throughout.



Sack covered with hair grass.

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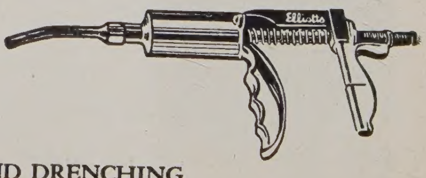

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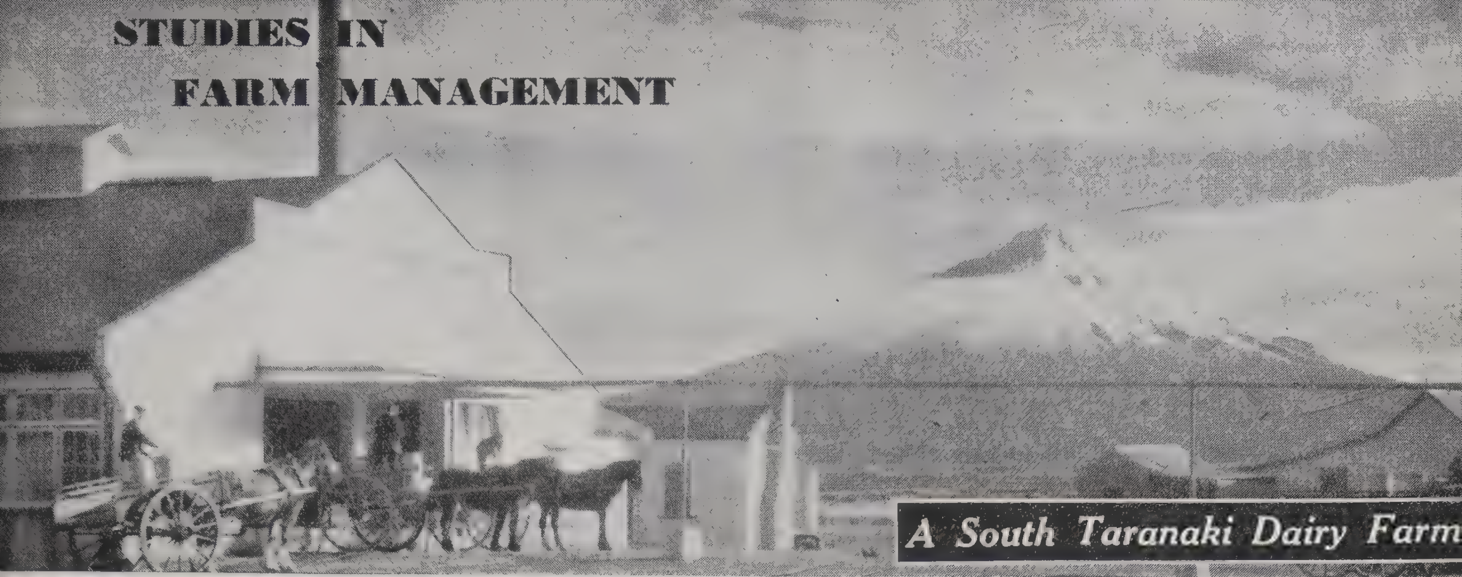
STUDIES IN FARM MANAGEMENT



A South Taranaki Dairy Farm

TARANAKI has always been looked on as "the dairy farm of New Zealand," and while some of its former glory may have departed, it still plays an important role in the production of dairy products. This article deals with the Waimate West County in particular, and details the activities and production on a typical dairy farm in that county.

PROMINENT on the west coast of the North Island, about halfway between Wellington and Auckland, is the land district of Taranaki, with the volcanic cone of Mt. Egmont rising to a height of 8,260ft. as an almost perfect cone in the centre of one of the most productive dairying districts in New Zealand. The influence of Egmont on the soils, climate, and topography of Taranaki is profound, but is limited in scope to the coastal belt 15-20 miles wide between Egmont and the Tasman Sea, and to an inland belt 12 to 15 miles wide which is bounded to the east by an extensive area of mudstone papa and sandstone hill country. While this steep inland hill country, which makes up about half the land district of Taranaki, is stocked mainly with sheep and cattle, and much of it is still rugged original forest land, the two inland coastal belts covered by volcanic showers from Mt. Egmont comprise the dairying land of the province.

SOUTH TARANAKI.

The four counties of Patea, Hawera, Waimate West, and Eltham, lying generally to the south and west of the mountain, make up the district known as South Taranaki. Whereas three of these counties, Patea, Hawera, and Eltham, have extensive inland areas of mudstone and sandstone hill country little influenced by Mt. Egmont, the Waimate West County, in which the farm later discussed in this article is situated, is covered entirely by soils of volcanic origin, and the climate and topography are completely influenced by the volcanic cone of Egmont.

Climate

The main influence of Mt. Egmont on the climatic conditions of South Taranaki is seen in the marked increase in the average annual rainfall from the 40-45in. per year at the coast near Manaia to 80-100in. in the area bordering National Park, which surrounds the base of the mountain. Mt. Egmont also influences the distribution of this rainfall, which is good during the summer and remarkably even throughout the year. The abundant rainfall and the high average of wet days are important factors in the success of dairy farming on the relatively light, free-draining volcanic soils of the area.

The average monthly rainfall at Hawera for the past 50 years, which is given below, illustrates the uniformity of the rainfall. The good average of 12¼in. for the four summer months fro December to March out of a total rainfall of 45in. for the year is an important factor in successful dairy farming in this district.

AVERAGE RAINFALL AT HAWERA FOR THE PAST 50 YEARS.

Month.	Average Monthly Rainfall. Inches.
January	3.51
February	2.40
March	3.01
April	3.48
May	4.58
June	4.51
July	4.22
August	4.50
September	3.42
October	4.65
November	3.78
December	3.25
Total	45.21in.

While Mt. Egmont is responsible for some harsh, cold weather in the winter, when the slopes are covered with snow, this effect is countered to a great extent in South Taranaki by the tempering influence of the sea and the relatively low altitude of the country from the sea coast to the foot of the mountain.

Frosts are generally light and seldom unseasonable. Winds both from the sea and the mountain are sometimes strong and troublesome, those from the sea, when strong and salt laden, cutting back anything but the hardiest hedge and timber plants. Temperatures are moderate and equable throughout the year.

By
J. E. DAVIES,
Instructor in Agriculture, Hawera.

Soils and Topography

Whereas the inland soils of South Taranaki have been derived from tertiary mudstones, papa, and sandstones, deeply dissected for the most part into steep ridges and narrow valleys, the dairying lands of the district are covered with deep volcanic ash showers thrown up in the past by Mt. Egmont; or in some places the soils are derived from the resorting of these ash showers by weathering agents and deposition by streams in their present form.

The three main ash showers are known as the Egmont shower, which covers most of the country from Patea to Manaia and is found again along the coast from beyond Waitara in the north to Okato; the Stratford shower, which extends in a belt from 4 miles inland from Waitara through

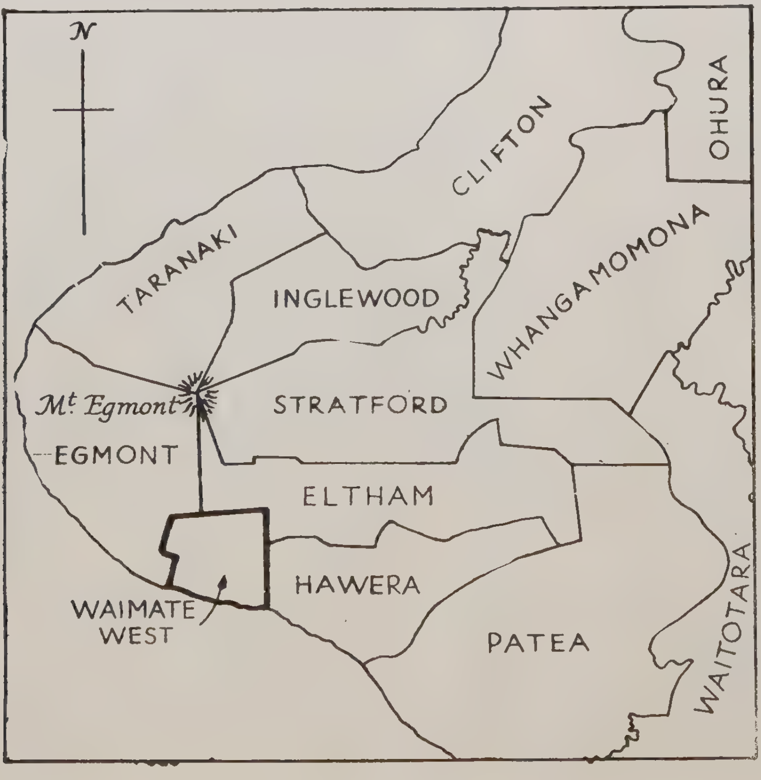
Midhurst, Stratford, and Eltham to Te Roti, and the latest shower, the Burrell shower, which covers part of the Stratford shower from Mahoe in the south around the mountain to Egmont village and Korito in the north. This last shower is thought to have been thrown up within the past 500 years.

The main soils in South Taranaki derived from the Egmont shower are the Egmont black loam and the Egmont brown loam. The black loam covers an area of 52,000 acres of a coastal strip from Patea to Otakeho, extending inland to Mokoia, Normanby, and Okaiawa. The soil is volcanic ash with 9in. of black loam topsoil, then 10in. of free light brown loam on a compact but free-draining light brown loam subsoil. The Egmont brown loam covers some 32,000 acres of South Taranaki inland of Normanby and Mokoia. The soil is similar to the black loam, but the topsoil is dark brown.

The Stratford shower also covers an extensive area. In South Taranaki this shower has been mapped as covering the Egmont shower over some 49,000 acres in the Eltham, Te Roti, Matapu, and Skeet Road districts up to the Manaia Road at Kapuni. This shower is also responsible for the soils in the Auroa district. In all these districts the Stratford shower is represented by a soil known as the Stratford sandy loam, which is a thin layer about 6-9in. deep of dark brown sandy loam overlying the Egmont shower of 6in. of free brown loam on deep compact brown loam subsoil. The topsoil is dark brown and moderately free, while the subsoil is a lighter brown and moderately compact and less free draining than in the Egmont black loam. A third main soil type known as the Glenn loam, covering 13,000 acres, is represented in the Manaia County as a narrow strip extending along the Stratford-Opunake highway towards Punehu and down from Riverlea to within two miles of Otakeho. The Manaia Road from Kapuni to Kaponga divides this soil type from the Stratford sandy loam. The Glenn loam is derived from water-borne ash shower material, and because of the formation of a well-developed iron or humus pan about 1-2ft. below the surface in many places, the soils are generally badly drained and support only swamp vegetation in their natural state.

In the Eltham district there are extensive areas, estimated at 8,000 acres, of soils derived from a mixture of peat and volcanic ash, which cover swamps lying east of the railway line, while near Patea and elsewhere along the coast there are soils derived from wind-blown sands estimated to cover about 6,000 acres.

These are the main soil types of South Taranaki. The soils in the vicinity of the farm later described are shown on the soil map of the locality, which indicates the farm as being near the boundary of the Stratford sandy loam.



The land from the sea coast to the mountain is generally flat and ploughable, sloping gently from sea level to a height of some 1,700ft. at the boundary line of the mountain reserve. The surface is dissected by the numerous typical Taranaki streams and creeks, the former running practically straight from the mountain to the sea in relatively shallow stony beds, and the latter originating in springs of clear water which form swampy channels leading to the streams.

WAIMATE WEST COUNTY.

This county, including the well-known Waimate Plains, has a coastal frontage of some 10 miles near Manaia and extends some 8 to 9 miles inland towards the mountain. The land is generally flat and ploughable, the surface being dissected by the usual streams and creeks. The rainfall of 40in. per year is somewhat lighter than the average for Taranaki. The soils of the county are fairly uniform, being friable, porous volcanic loams, black to reddish brown in colour, warm and free draining where they derive from the Egmont black loams along the coast and the Stratford sandy loams further inland, but difficult to drain where they are underlain by a cemented iron or humus pan, as in the Glenn loams found along the Upper Glenn and Rama Roads and the Kapuni-Auroa Road.

History and Progress

The history and progress of the Waimate West County are typical of those of similar country in the adjoining counties of Eltham, Hawera, and Egmont. Settlement of this part of Taranaki was slow until about 1880, when numerous land sales and leases brought an influx of settlers and rapid development of the fern- and flax-covered coastal belt commenced. After clearing of scrub the land was easily ploughed and cereals were grown. As settlement progressed inland the much more difficult task of felling and burning the heavy rata, matai, and tawa bush, with its tangled undergrowth of supplejack and ferns, which covered the land from near the coast to the mountain, faced the settlers. Pastures were slowly established by felling the bush in winter and spring, burning the fallen timber and underscrub in the summer, and surface sowing English grasses and clovers on the ash of the burns. Cattle raising and fattening were developed on these bush burns, and the Waimate Plains became noted for its wheat, oats, and barley, for its fat cattle, mainly Shorthorns, while the inland bush clearings also added a considerable production of first-class cocksfoot seed, which was harvested by hand, as at Akaroa. From about 1900 onwards, as logs were cleared by fires and stumps were taken out and the land could be ploughed, dairying became more and more prominent, the early dairy factories manufacturing butter. During the first 30 years of dairying green fodder crops, such as oats and lucerne, together with root crops of mangolds, carrots, soft turnips, and swedes, played a prominent part in the feeding of dairy cows. In the past 15 to 20 years, however, the improvement of pastures by the extension of phosphatic topdressing and liming, better utilisation of the growth from these pastures through more intensive stocking and improved grazing management, together with better control of summer pasture growth by mowing for hay and silage have resulted in the elimination of most of the supplementary cropping, and the dependance almost entirely on grass and grass products for the entire feed supplies of the dairy herds.

Thus farming in this county, as in large parts of adjoining counties, has passed through three main phases. First, development of scrub and forest land to pastures, with stock fattening and cereal growing as the main features. Second, the change to dairy farming, with some fat lamb raising, the pasture growth being supplemented with root and fodder crops. The third stage is the present dominance of the all-grass dairy farm, with specialised grazing management of pastures and dependence on surplus grass reserves of hay and silage for stock food in periods of grass shortage.

The following statistics for the Waimate West County illustrate the change from the second to the third phase in so far as dependence on crops as supplementary feed is concerned.

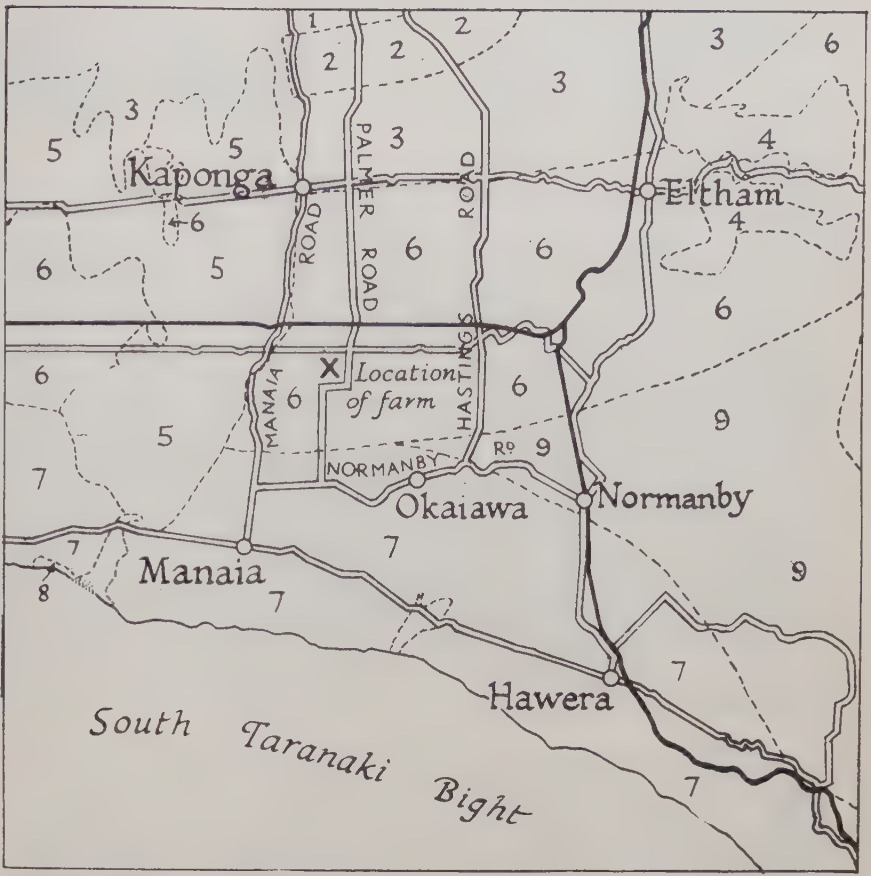
Year.	Area cut for hay & silage.	Area in grain & pulse crops.	Area in green fodder crops.	Area in turnips & swedes.	Area in mangolds.	Area in other crops.
1922-23 ..	3,987	749	448	1,879	168	285
1932-33 .,	9,725	658	183	1,200	62	—
1942-43 ..	7,371	165	151	284	5	3

The Waimate West County is the most densely-populated rural community in New Zealand. Of the 52,200 acres in the county, 49,685 acres are occupied, with some 47,326 acres in sown grass.

There are 432 holdings of upwards of 5 acres, the average size of holding being 115 acres. The county is further notable in having the high ratio of nearly 530 dairy cows per 1,000 acres of occupied land.

The trend in recent years in livestock population of the county is shown below:—

	1926-27.	1931-32.	1936-37.	1941-42.
Horses ..	1,454	1,216	1,212	1,144
Dairy cows ..	19,476	20,669	24,896	26,177
Other cattle .	6,121	7,565	7,200	10,519
Pigs		4,679	8,598	6,796
Sheep shorn .	5,011	5,334	10,136	12,661
Lambs tailed	4,800	5,114	7,632	8,513



Legend
1. Burrell gravelly sand on loam
2. Inglewood coarse sandy loam
3. Stratford sand
4. Eltham peaty loam
5. Glenn loam
6. Stratford sandy loam
7. Egmont black loam
8. Patea sand
9. Egmont brown loam

The 15-year period covered by these figures illustrates two rather important trends: first, the continued increase in the number of dairy cows being milked, together with the decided increase in other cattle, mainly young dairy stock and fat cattle. There is also to be noted the marked falling off of pigs in the last five years, which has been offset by the increase in sheep shorn and of lambs tailed.

That the pastures of the county have improved in carrying capacity during the 15 years, in spite of the reduction in area under fodder crops, is well shown by the increases in dairy cows, in other cattle, and in sheep in 1941-42, as compared with the numbers carried in 1926-27.

A WAIMATE WEST COUNTY DAIRY FARM.

The farm which is the subject of this study has been owned and occupied by Mr. A. E. Luscombe for the past 20 years, being part of Section 44, Block XV, Kaupokonui S.D., situated on the corner of Skeet and Palmer Roads, about 2 miles from Kapuni. The area of 174 acres, though larger than the average holding, has been developed along the same lines as other farms in the district, and is located on a typical area of Stratford sandy loam soil, which is very similar in texture, composition, and fertility to the other main soil types represented in the dairying districts of South Taranaki, namely the Egmont black and brown volcanic loams.

Pasture Improvement

The land was originally covered in heavy rimu, rata, matai, and tawa

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rain forest, and when purchased by Mr. Luscombe it had reached the stage where about half the area was in satisfactory pasture, which could be improved without further ploughing, while half required stumping, ploughing, and levelling before resowing. During the first 10 years Mr. Luscombe proceeded with this work. About seven to eight acres were stumped each year and ploughed for cropping, to provide supplementary feed for the herd. The crops grown included both roots—swedes, soft turnips, and mangolds—and, as a second crop when required, green fodder, including cereals for silage or feeding out.

In sowing to grass, which was done in the spring if after a fed-off root crop or in the early autumn when a green fodder crop such as oats followed on an area of roots which were carted off, the grass seed mixture consisted of 24lb. perennial rye, 15lb. Italian rye, 12lb. cocksfoot, 2lb. timothy, 3lb. red clover, and 2lb. white clover, a total of 58lb. of grass and clover seeds per acre. By 1935 some 75 acres had been dealt with in this way, while steady improvement of the pastures on the rest of the farm had been made by topdressing, some levelling where necessary, and pasture harrowing.

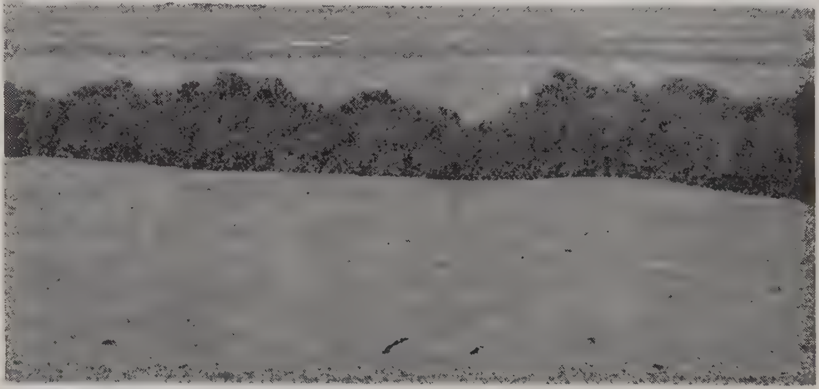
It was at this stage that all cropping for the purpose of supplementing the stock food provided by the pastures was discontinued, and during the past 10 years the pastures have been relied on completely for all feed for the milking herd and other stock. Pasture treatment, management, and utilisation have thus become of outstanding importance.

With more reliance being placed on the pastures to provide adequate feeding for the dairy herd, which has been considerably increased during the development of the farm to its present high standard, topdressing has played an important part. At first up to 10cwt. per acre of lime was used on the better pastures, followed by about 1cwt. per acre of basic slag each year. As stocking increased and cropping was discontinued the amount of fertiliser was increased to the pre-war practice of applying to all pastures in April and May 3-4cwt. per acre of a mixture of three parts superphosphate and one part 30 per cent. potash salts. In addition areas cut for hay and silage, amounting to some 50 acres, received an extra dressing of 1½cwt. per acre of the same mixture in December or January after the grass crop was harvested. Carbonate of lime is applied at the rate of 10cwt. per acre every two years as a standard practice.

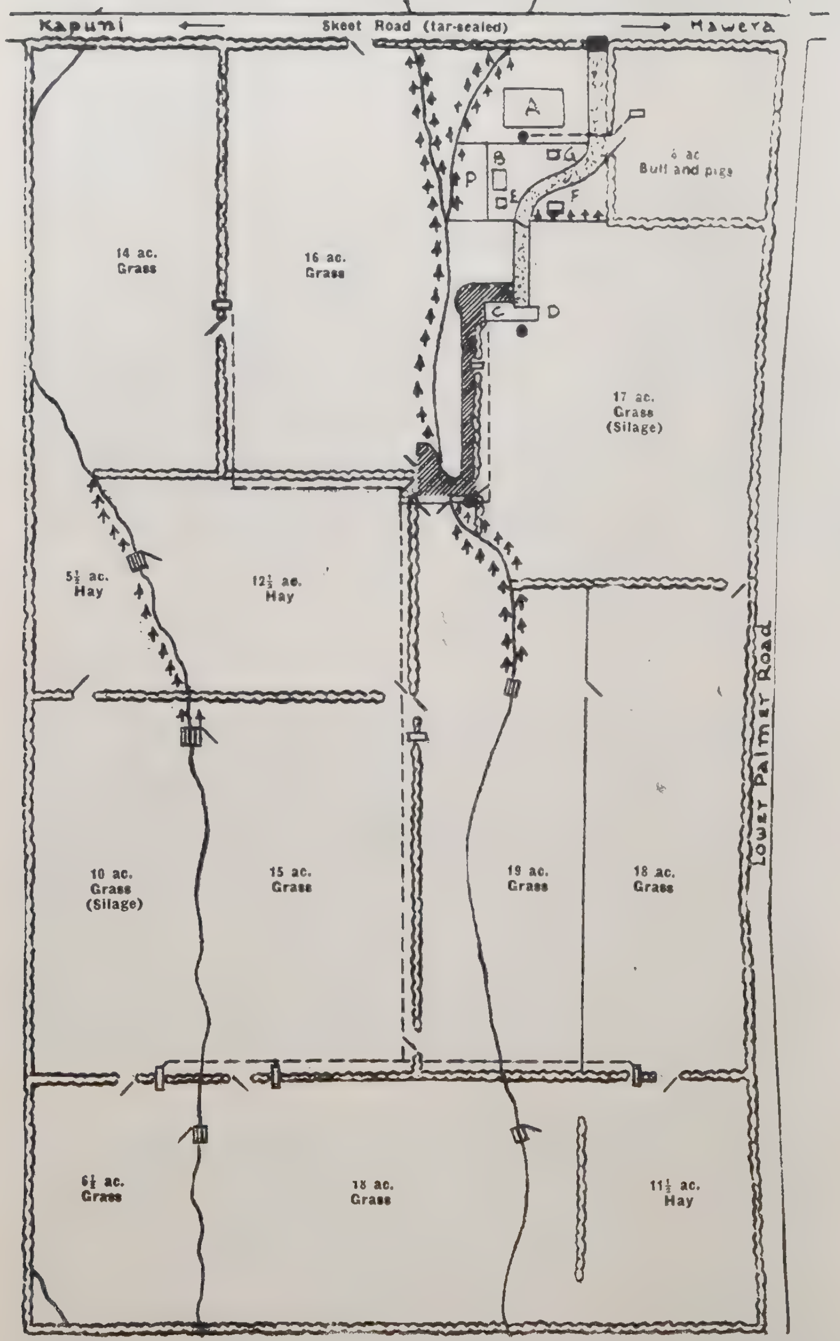
Pasture Management

It can be claimed that management on this farm has become of more importance than topdressing in the im-

VIEWS OF THE DISTRICT



PLAN OF FARM



A. Residence. B. Machinery and fertiliser shed. C. Cowshed. D. Milk stand-truck garage. E. Feed shed. F. Poultry shed. G. Garage. P. Pig run.

provement of pastures and maintenance of increased grass production. The fact that, despite frosts and cold winds, grass, if properly sheltered, continues growth in this district into the winter and will hold in readiness for the cows as they calve in July and August, is used to advantage. As the herd is dried off in May and early June silage and hay are fed out on a restricted area of the farm, the remainder being closed to provide late winter and early spring grass. A good 4 to 6in. of growth is obtained, and this grass is rationed to the milkers at the beginning of the season by allowing the herd on the grass for a few hours and supplementing their feed with hay and silage. Thus a good start to the milking season is assured. The aim in using the pasturage saved for the early part of the season is to make it last until the fresh spring growth is available, and Mr. Luscombe believes in having plenty of silage as well as hay for this period of July and August.

During the six months from August to January strict rotational grazing of each paddock in turn is practised, the farm being subdivided for this purpose. With some 13 paddocks varying from 6 to 18 acres, the rate of stocking with 147 cows is from 8 to 24 cows per acre, and by grazing two to four days in each paddock a rotation of three weeks to one month before the next grazing of any paddock is secured.

However, when the hay and silage paddocks are missed from the rotation in September and October, when good growth can be expected, the number of paddocks being grazed is reduced to eight or nine, and the rotation is also reduced to about two weeks or less. It is nearly always necessary to run the mower over the paddocks to keep the feed back to the 4 to 5in. of growth necessary for dairy cows, and to cut back those patches of roughage which, when once neglected by the stock, are seldom eaten down again during the season, unless they are cut right back.

In the late summer and early autumn there is a tendency for the herd, if confined to small paddocks, to become lazy and fat. Several paddocks are then opened up at a time, so that the herd has a greater area to feed over, and there is no objection to some roughage developing at this

Key to Plan:

⌇	African boxthorn hedge
—	Post-and-wire fence
∪	Gate
▭	Water trough
●	Water pump
- - -	¾in. water pipe line
▨	Concrete roadway
▒	Metal roadway
▤	Cattle stop
⧄	Culvert
⧄	Culvert and gate
♠♠	Macrocarpa and pine

time, if growing conditions are suitable. The opening of the gates of two or three adjoining paddocks is considered of real value in maintaining the herd in healthy working condition, and is no detriment to the pastures at this time.

Another important factor in the full utilisation of the pastures and in the proper feeding of the herd is the provision of adequate supplies of hay and silage, all cut from the surplus growth of pastures. Some 50 to 60 acres of grass are cut each year for hay and silage. In the 1941-42 season 30 acres were cut for silage and 26 acres for hay, this proportion of silage to hay being an important contrast to the general practice in the county, where for the same season 7,380 acres were cut for hay and only 982 acres for silage. The owner has found grass silage particularly valuable in maintaining the herd in healthy condition in the winter and early spring, while it is often used to keep up milk production in a really dry season. The silage is cut and made in November, when it is often too wet to be safe for haymaking, but the early-closed pastures are at their best for cutting. These first-harvested paddocks make rapid growth after cutting, and are always back into the rotation early in December, thus providing against a dry period at this time of the year. Haymaking is arranged for December, and sometimes in a late or wet season hay is cut in January. Grass harrowing is the only cultural operation carried out on the farm. A light penetrating harrow as wide as the tractor power unit will pull comfortably is used, chiefly for the purpose of distributing cow droppings. All pastures are harrowed at least once a year, and more frequently if required. During the spring and early summer, and again in the late autumn, pasture growth is so vigorous that the bulk of the droppings, which are soft at this time, are broken up by the growth of grass, and harrowing is not nearly so necessary today as it was some years ago.

In the management of the pastures the light tractor equipped with a 6ft. mower and a tractor sweep is invaluable in harvesting hay and silage and in removing roughage, and, with topdresser attached, in getting over the farm with fertiliser with a minimum of labour and lost time. No horses are used on the farm.

The herd on the farm of 174 acres has averaged about 145 grade Jersey milking cows for the past eight seasons, with the butterfat production ranging from 38,000lb. to 46,000lb. in the same period. Details of herd numbers and butterfat production for the past eight seasons are given in the accompanying table.

BUTTERFAT PRODUCTION ON MR. A. E. LUSCOMBE'S FARM OF 174 ACRES FOR EIGHT YEARS FROM 1936-1937 SEASON.

Season.	Butterfat production in lb.	No. of cows milked.	Average butterfat per cow.	Average butterfat per acre.	Annual rainfall in inches.
1936-37	.. 38,612.5	139	277.78	221.91	48.63
1937-38	.. 40,790.4	139	293.46	234.43	43.31
1938-39	.. 39,263.6	140	280.45	225.65	44.97
1939-40	.. 43,024.7	141	305.14	247.27	33.54
1940-41	.. 43,458.0	137	317.21	249.76	40.01
1941-42	.. 45,606.4	147	310.25	262.11	57.62
1942-43	.. 46,013.9	147	313.02	264.45	38.39
1943-44	.. 41,257.0	154	267.90	237.11	47.13

Note. There was a general drop of approximately 15 per cent. in butterfat production in the district in the 1943-44 season, due to adverse spring weather conditions followed by a dry summer.

While these figures are not outstanding as regards butterfat production per acre of land, or in butterfat production per cow, they are an indication of the efficient methods both of herd management and pasture utilisation. Regularity of milking is a feature of herd management in the summer, morning milkings commencing at 5 o'clock and evening milkings at 4 o'clock. Calving is arranged to commence early in July, and it is the aim to have the whole herd in production by mid-September. A typical calving record, that of last season, shows 45 cows calved in July, 85 in August, 12 in September, with 5 late calvers. Mr. Luscombe provides for early calving, which he stresses is essential to good production.

During the milking season the cows are kept in good working condition; over-condition in the summer and early autumn is considered very undesirable, and is prevented by the system of pasture management, which makes the cows move about freely to secure their feed requirements. The milking season ends about mid-May, when the condition of the herd is built up by adequate feeding of hay and silage, plus grass, to calving time.

The peak of production comes about the end of October, but there is seldom any decided falling off in milk supply until well into January.

About 20 per cent. of the herd is replaced each year, culling on account of disease being responsible for about 12 per cent. of replacements, while the remainder are culled for age, injury, or unsatisfactory production. The diseases include temporary sterility, mammitis, abortion, and some few cases of grass staggers. While it is still the general practice in South Taranaki to breed and rear herd replacements on the farm by selecting heifer calves sired by a selected bull from tested cows, Mr. Luscombe, in common with a number of other progressive farmers, found that home-reared heifer calves weaned on to good pastures in relatively small paddocks on flat land became fat and

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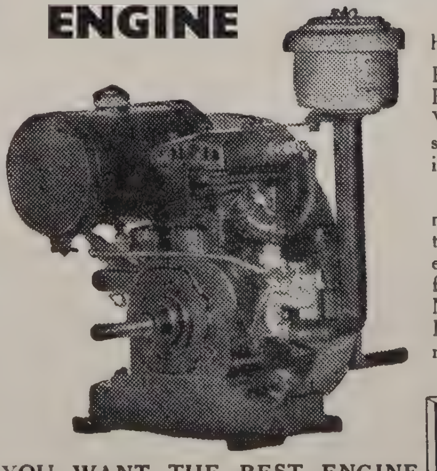

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VIEWS OF THE FARM

The homestead

Boxthorn hedge

Concrete crossing

Topdressing

Dairy herd

Water supply

lazy. They proved shy breeders and were subject to disease after calving if kept on the farm as replacements. Heifers bought in from hill-country farms to make up deficiencies in home-reared heifers who failed to breed were much more satisfactory in regular breeding and resistance to disease, and were moreover able to produce well under good feeding and management. Some 10 years ago Mr. Luscombe commenced to sell all weaned calves of his own rearing, replacing these with two-year-old in-calf heifers purchased from selected inland hill-country dairy farms, where climatic conditions are much more severe and the feed supply less abundant in the summer and autumn. An increasing number of South Taranaki dairy farmers with similar experience now look to selected hill-country farmers for herd replacements.

The majority of the calves on the farm are now sold at one week as bobby calves, a few being sold to other farmers for rearing.

At one stage a feature of herd management, herd testing has been discontinued, since the major portion of herd replacement is on account of disease, injury, and age, and replacements are not now bred on the farm. Moreover selected pedigree bulls are not now used.

While this policy of herd replacement by purchase of surplus heifers from hill-country farms may be developed with advantage by a certain proportion of farmers on the closely-subdivided, high-production farms, there is a definite limit to its extension, since the number of heifers required can readily exceed the supply, as the proportion of dairy cows on the intensively-farmed areas is very much in excess of that on the hill country suitable to supply such replacements.

The problem of the proper management of home-reared heifer calves from weaning to calving to avoid, or at least minimise, the ill effects of close subdivision, lack of exercise, and abundance of feed has been solved by many farmers, who have an undoubted advantage in the selection, breeding, and feeding of their own replacements. However, Mr. Luscombe and other leading farmers are well satisfied that it pays them to arrange with suitable farmers for the supply of heifers raised under harder conditions, and it would appear that such heifers are capable of satisfactory production when brought into the rich pasturage of lowland farms, although their breeding may not be of the best.

That the methods of herd and pasture management on this farm have not been very much at fault is shown by the record of production over the past eight years.

Pigs

In common with the majority of dairy farms in South Taranaki the farm supplies a cheese factory, and whey only is available for pig production. Purebred Berkshire sows are mated with pedigree Tamworth boars to produce the hardy, good-doing Berkshire-Tamworth first-cross pigs for fattening.

Farrowing is arranged for two periods, July to September and January to March. The spring litters are fattened as baconers, and the January-early February litters are disposed of as light baconers or porkers, while the later litters are carried through the winter and fattened as baconers in the spring.

The carry-through of sufficient pigs to make full use of the abundant whey supply in September, October, and early November, which is available before the July and August litters are big enough to consume the feed, is of considerable importance. These early baconers are disposed of as the new season's pigs develop and require more feed.

The sows are allowed extended grazing on the cow pastures and are brought into grass pens with movable houses for farrowing.

The weaners and fattening pigs are kept in open, small grass paddocks, each with a movable house. Feed consists of whey with meatmeal supplement, the whey being backloaded from the cheese factory and stored in drums for feeding. No special effort has been made to develop pig meat production, but the production of 10,588lb. of pig meat in the 1941-42 season, with an average of 72lb. of pig meat per cow with a herd of 147 cows, is well above the average for the district.

Shelter

A feature of the farm is the splendid shelter for stock and pastures provided by the African boxthorn hedges. This hedge plant is one of the few able to withstand the periodic strong, salt-laden winds which come in across the plains from the Tasman Sea. Boxthorn finds ideal conditions for strong and rapid growth in the deep, friable, free-draining soils of the district. When trimmed it forms a dense stockproof hedge of whatever height desired, and, if left untrimmed for several years, it forms a thick, wind-resistant shelter belt up to 15ft. high, which can be cut back alternately on one side and then the other to keep it from spreading too far into the paddocks.

The establishment of boxthorn as a hedge is in itself an art to be learnt by newcomers to this country if they are to succeed with it. Though hardy enough when established, the young plants can be readily smothered by the growth of grasses along the hedge line. The young plants are usually obtained from nurserymen, though they can be raised easily from seed. A shallow ditch about 1ft. wide is dug along the hedge line, the turf being placed grass down along the side of the ditch. The next half spit of earth from the ditch is placed on the turf, and on this blood and bone is sown. The well-rooted plants are then placed horizontally on the low bank, with the heads extending over the ditch, the usual spacing being about 6 to 8in. apart. A further full spit is then removed from the ditch, carefully placed over the roots of the plants, and firmly pressed into place. The advantage of this method lies in the fact that the soil used for

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planting is fairly free from weed seeds, and the growing parts of the plants over the shallow ditch are, for the period of establishment, free from competition by grasses, etc.

The boxthorn will form a stock-proof hedge in two to three years from planting, a temporary guard fence being erected to protect the plants for this period.

Farm Water Supply

Although two creeks with good water run through parts of the property, the water supply for the stock is provided from several wells, giving a never-failing supply. Water is pumped by electricity through pipes to substantial home-made circular concrete water troughs on the fence lines, each to serve at least two paddocks.

During recent years special efforts have been made to eliminate as far as possible the mud nuisance of the dairy farm. In particular, clean access to and from the milking shed has been achieved by concrete roadways to a main access paddock, which gives access to most of the other paddocks on the farm.

Equipment and Amenities

The farm equipment includes an 8-cow milking plant in a substantial wooden milking shed with concrete floors and holding yards. The milking plant, water heating, and three water pumps are operated by electricity. The 19 h.p. tractor on rubber with 6ft. mower attachment also operates the rotary fertiliser distributor, the hay sweep, the side-delivery rake, the 16ft. chain and tripod harrows, the tractor trailer, and the roller, which, with a stacker of the grab type, comprise the full range of farm implements. The whole milk is carted in a lorry to the factory about a mile away. No horses are kept on the farm and no cultivation equipment. Other buildings include a lorry shed and milk room of timber, with an iron roof 30ft. x 10ft., a corrugated iron machinery shed 68ft. x 20ft., a stores shed of timber 22ft. x 8ft. 6in., a corrugated iron feed shed 8ft. x 10ft., and a poultry house 22ft. x 8ft. 6in.

Besides being an efficient farmer, Mr. Luscombe has designed and built all the farm buildings and installed the milking plant and water system on the farm.

The farm has a tarred macadam road frontage, and is ¾ mile from a railway station, 2 miles from school, and 1 mile from the dairy factory. There is a daily mail delivery and a passenger service to the main centres twice daily. Electric power for lighting, heating, cooking, and for the usual electric appliances makes living conditions in the substantial dwelling but little different from those in the nearby provincial town of Hawera, which is easily and quickly reached by motor-car on excellent tar-sealed roads.

With the exception of some casual labour at harvest time, the farm is run entirely by Mr. Luscombe and his wife and family of one son and five daughters. The daughters have taken over full responsibility for the milking of the herd, and one of the outstanding features of this farm is the competence of the girls and the interest they take in the progress of the herd.

Acknowledgments

Mr. Luscombe and his family are thanked for their co-operation in the preparation of this study.

Thanks are expressed to the Director of the Soil Survey Division of the Scientific and Industrial Research Department for the data in the soil map, and to the Lands and Survey Department, Wellington, for the drawings of the maps.

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Disinfection and Disinfectants

SOME of the principles underlying the use of disinfectants are discussed in this article and reference is made to some of the more common methods of disinfection. In all aspects of animal hygiene cleanliness is of first importance. The tendency is for most farmers to overrate the power of disinfectants, but sooner or later they find that disinfectants will not prevent an outbreak of disease under dirty conditions. Proper cleaning will remove most germs, and with clean animals kept under clean conditions the use of disinfectants is usually not necessary unless disease breaks out.

THE following is a definition of some of the terms commonly used:

Disinfectant or Germicide is an agent that renders infective material harmless by destroying the micro-organisms.

Antiseptic. An antiseptic prevents or retards the growth of bacteria without necessarily destroying them. Most disinfectants are antiseptics in weak solution.

Sterilisation is the term used to indicate the complete destruction of micro-organisms, usually carried out by heat.

Deodorant. A deodorant absorbs or destroys odours, but it may not have any disinfectant or antiseptic action. Some disinfectants have a characteristic odour, but there is often no connection between the disinfectant value and the odour. Disinfectants should, therefore, be chosen on account of their known powers of disinfection, and not on account of their odour.

Many good disinfectants are now available to the farmer. It is well to remember, however, that the results obtained by the use of a disinfectant usually depend more on the method and thoroughness with which it is applied than on the particular disinfectant used.

The following are general principles underlying the use of all disinfectants.

1. Chemical disinfectants are ineffective in the presence of much dirt. Thus the first essential in the disinfection of a building, for instance, is to have a thorough clean-up and scrub out with hot water and caustic soda or soap. Then if the disinfectant is applied as a spray, there is some chance that it will actually come in contact with the germs and destroy them. Never apply disinfectant to a dirty or greasy surface.

By

A. G. BRASH, B.V.Sc.,
Veterinarian,
Christchurch.

2. All chemical disinfectants require time to act. Only the more fragile bacteria are killed in a short time. The more resistant bacteria and the spores may survive for several hours. The tubercle bacillus, for example, can withstand a 5 per cent. solution of carbolic acid for over 24 hours, but is killed by boiling in less than a minute.

3. All chemical disinfectants act more rapidly in warm or hot solutions than in cold ones. This effect is quite marked, and as an example it may be stated that most disinfectants take at least four times as long to act when the temperature is reduced by 20°F.

4. Apply the disinfectant liberally and thoroughly at the strength recommended by the manufacturers. It is well to avoid guesswork, as weak solutions may not be effective, and over-strength solutions are unnecessarily wasteful.

5. A disinfected article is sterile only so long as it is kept from contact with infected material. Do not follow the example of the farmer who, after carefully sterilising his knife at marking time, proceeded to sharpen it on his boot.

Physical Disinfectant Agents

Heat is one of the most effective means of destroying all forms of microscopic life, but its application in practice is, of course, limited. Flaming of floors and walls of buildings is an efficient means of disinfection. To be effective flaming must be thoroughly carried out, and the job must not be hurried. Sufficient time must be taken for the flame to impinge for several seconds on every part of the area to be covered. Moist heat in the form of boiling water or steam, either free flowing or under pressure, is more penetrating than dry heat, as in an ordinary oven. For all ordinary purposes boiling for 10 to 15 minutes may be considered sufficient to bring about sterilisation. Many disease-causing organisms are killed by boiling in less than a minute, but some are more resistant, especially those which form spores. The spores of the lockjaw bacillus, for instance, can withstand boiling for over 5 minutes. Instruments may be sterilised by boiling for 10 minutes, and the addition of 1 per cent. washing soda to the water will prevent rusting and increase the efficiency of the boiling. Free-flowing steam has the same temperature as boiling water, that is, 212°F. at sea-level. It is especially useful in the dairy industry, and, while short exposures will not destroy resistant spores, the destruction of practically all types of organisms which cause souring of milk is assured by this method. When milk cans are placed over a steam jet the steam condenses and heats the surface to approximately the temperature of boiling water. Steam under pressure has a temperature higher than boiling point, varying according to the pressure, but this form of sterilisation is not usually available to the farmer.

Cold. Although it is popularly believed that freezing temperatures have a killing effect on bacteria, this is not so. Unlike the higher animals practically all bacteria are resistant to extreme cold, and, in fact, will live longer in cold temperatures than when maintained without food at their optimum temperature for growth. One common organism that would be killed by boiling in less than a minute was found to withstand a temperature of —190°C. for 24 hours without injury. Bacteria are also resistant to changes of temperature. Anthrax organisms were frozen with carbon dioxide at —90°F. and thawed in water 24 times in succession without losing their ability to produce disease. Thus, for all practical purposes, cold has no value as a disinfectant.

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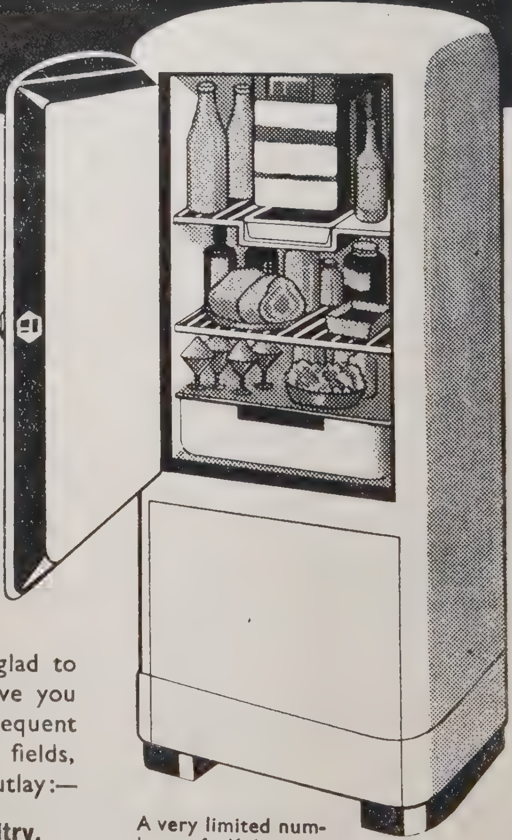

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Sunlight. Sunlight has very marked bactericidal properties and acts as a natural disinfectant, so that it is not without some reason that people think of sunlight as almost a symbol of health and cleanliness. However, the killing effect of sunlight on disease-causing organisms must not be overrated, as under field conditions bacteria are often protected from the direct rays of the sun. The presence of even small amounts of mucus or other organic material is sufficient to protect the tubercle bacillus from the effect of sunlight.

Some Chemical Disinfectants

There are numerous chemical disinfectants, and no attempt is made to mention all of them. The important thing is to remember the general principles for their application as enumerated above.

Lime. It is well to remember that only burnt lime, or freshly-slaked lime, has any value as a disinfectant. Carbonate of lime, or burnt lime that has been exposed to the air for some time, is useless for this purpose. Slaked lime is obtained by adding about 1 pint of water to 2lb. of burnt lime. Burnt or water-slaked lime is of value for disinfecting the top soil of yards, etc., if applied liberally. Whitewash or milk of lime made from freshly-slaked lime has some disinfectant properties when first applied, besides helping to improve the appearance of fences, pens, and outbuildings. It is not suitable for use about dairy sheds owing to its tendency to flake, and white-washed walls cannot be cleaned effectively.

Caustic Soda in the form of a 2 per cent. solution is an excellent disinfectant, apart from its value as a cleansing agent for greasy surfaces. It is particularly effective against the organisms causing contagious abortion. Its value as a disinfectant is greatly enhanced if a hot solution is used. Caustic soda solution is also recommended as the best method of cleaning milking machines, and is used at the rate of one heaped teaspoonful to 4 gallons of hot water (.05 per cent.). The water should be as near boiling point as possible.

Condy's Crystals (permanganate of potash). A solution of Condy's crystals sufficient to colour the water a deep pink is a useful disinfectant. It has the advantage of being odourless. Its disadvantages are that its action is impaired by organic matter, and it stains various materials a brown colour. To be effective the solution must be renewed as soon as it becomes discoloured.

Disinfecting the Hands

It is in fact impossible completely to disinfect the hands, no matter how thoroughly the job is done. People who imagine that the hands can be disinfected by dipping them for a few moments in a disinfecting solution are merely deluding themselves. It is, however, important to have the hands thoroughly **clean** before undertaking such operations as marking of lambs, castration of pigs, or assisting cows or ewes at calving or lambing time. This cleaning is best carried out with a good brush, soap, and hot water (preferably running water) after the nails have been cut short. After this cleaning process, which should occupy several minutes, the hands may be soaked in a suitable disinfectant solution. Owing to the difficulty of disinfecting infected hands, every farmer knows that he should avoid skinning or handling dead animals at lambing or other times when clean hands are essential.

Disinfecting Poultry Runs

The first and most important part in the disinfection of an infected building is the cleaning of the interior by scraping and sweeping. Disinfection is not likely to be effective without this preliminary thorough clean-up. The droppings, scrapings, and litter should be burnt or mixed with quick-lime and removed from contact with fowls. The walls and roosts should be scrubbed with hot water containing caustic soda (2 per cent.) to remove all dirt and grease. This acts also as a disinfectant. The house may then be washed, or preferably sprayed, with a reliable disinfectant. The infected runs should be topdressed with ground burnt lime at the rate of 2 tons to the acre, and where practicable be ploughed up and left vacant for 6 months. Dead birds should be burnt or buried in quicklime. Where parasitic infection has been heavy the liming method may be used, or the land may be sprayed with a 1 per cent. solution of commercial sulphuric acid. Another method is to put down a layer of cinders 4 to 6in. in depth. Where tapeworm infestations have occurred different treatment is necessary to kill the intermediate hosts, e.g., snails and slugs. For this purpose 1 part of powdered copper sulphate (bluestone) may be mixed with 4 to 6 parts of dry sand, and applied at the rate of 28lb. of copper sulphate per acre. Summer is the best time for this treatment, and the mixture should be spread when the ground is wet after rain.

Disinfecting Shearing Sheds

The recommendations in connection with poultry buildings apply also to shearing sheds, the first essential being a thorough clean-up and scrub with caustic soda solution to remove grease and dirt, followed by spraying with a reliable disinfectant.

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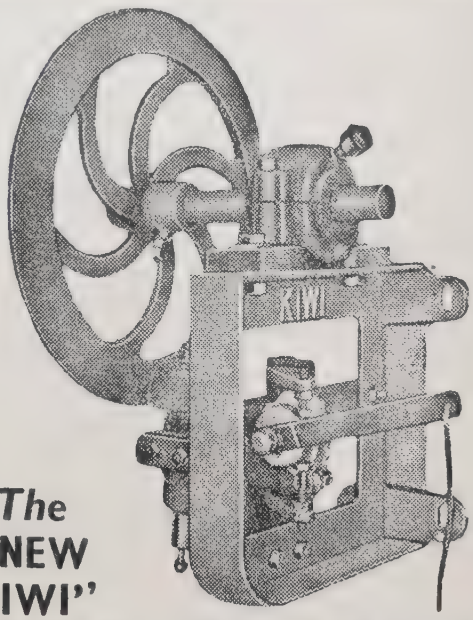

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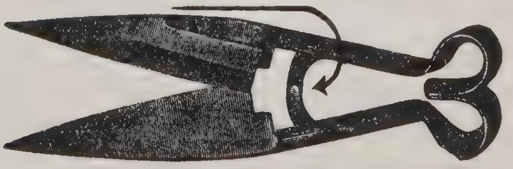

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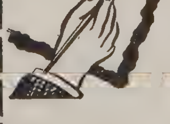

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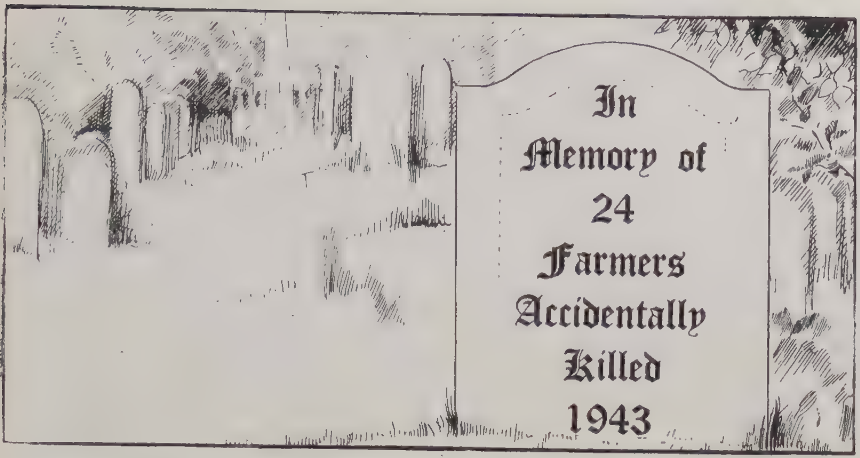


THE general public are kept continually conscious of the risks associated with such so-called "dangerous" occupations as mining, stevedoring, etc., and by contrast agriculture is commonly regarded as "safe." While the number of accidents affecting agricultural workers may be slight in proportion to the numbers employed, the word "safe" can be considered only as a relative term.

By P. S. SYME,
Instructor in Agriculture, Warkworth.

LIKE every other industry, agriculture, too, has its occupational hazards. These, as shown by the Government Statistician, are by no means negligible.

It will be noted that the figures quoted represent actual deaths caused, and it may fairly be assumed that for every such death there must also be perhaps as many as 20 or 30 non-fatal accidents, resulting either in permanent disability or some less serious injury. Viewed in this light, it will be seen that accidents exact a heavy annual toll.

Accidents Will Happen

Admittedly, accidents will happen. but let it also be admitted that **many accidents need not have happened.** Because of the human element, some accidents are as inevitable as they are simple. Falls in general are a prolific cause of injury. Often they just happen. But, if the fall was due to slipping on smooth sloping concrete or a "wobbly" step, then it may be argued that such an accident could have been avoided and was in fact due to contributory negligence in so far as such traps for the unwary invite an accident. Considered from this point of view, there is no room to doubt that with reasonable care the accident rate on farms can be very appreciably reduced.

Machinery a Common Cause

As shown in the accompanying list, the majority of farm accidents are associated with the use of machinery, and it is a fairly safe assumption that a considerable number occurred in the harvest field. The mower, the stacker, and the simple pitch-fork each year exact their toll of human suffering, and yet, surprisingly, such accidents are in the main the least inevitable and the most culpable. The driver who, without due precautions, steps in front of the knife-bar to clear the fingers of a horse-drawn mower is merely extending a warm invitation to trouble. Similarly, if used with reasonable care, the stacker is absolutely safe, but it becomes a potential menace to the crew if it is carelessly erected or treated with neglect. Every farmer knows the various points requiring attention to ensure complete safety, and in the event of injury due to a slipping cable or to a breakage, it might be hard to avoid a verdict of culpable negligence.

Many accidents occur on farms throughout the year, and even though the great majority are non-fatal, in the aggregate they represent a considerable amount of suffering and monetary loss. This article discusses some of the common causes of accidents and suggests how the number might be reduced.

The additional hazard introduced by overhead power lines, particularly if only recently installed, should also be kept in mind when erecting a stacker. The danger of dropping a pitchfork from a high stack, point downwards, needs no emphasis. It is just as easy and very much safer to hand it down with the prongs upwards.

Accidents in the Shed

Apart from accidents due to machinery in the field, a very fertile source is commonly to be found nearer home—in the shed. Few accidents can be more terrible than being caught in the belting of a pulley or in the pulley key of a revolving shaft. Such accidents can be absolutely prevented by a little forethought, yet they continue to happen. Obviously, for each such accident, someone was culpable.

The Chronic Bolter

Though less frequent than accidents due to machinery, injuries very commonly result from the use of farm implements. While the causes may be variable, not a few are due indirectly to a bolting horse. It is well known that if—usually due to a sudden fright—a horse once succeeds in bolting, it is very apt to become a chronic bolter, and should never thereafter be completely trusted. Such a horse, given the slightest provocation, will certainly bolt again, with grave risks to an unwary driver.

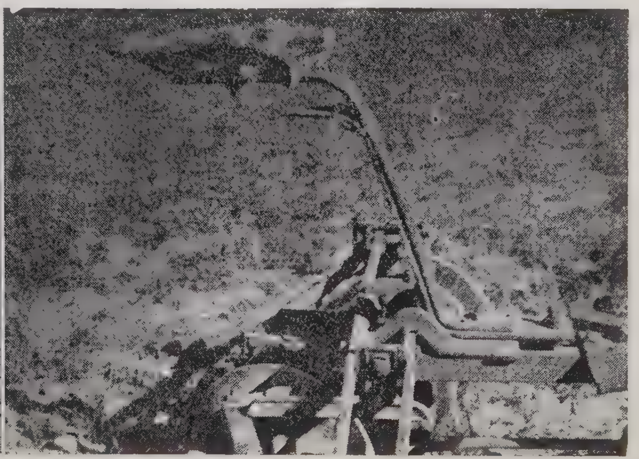
A Common Weakness

Though implements in general may be less dangerous than machines, many have one weakness in common—the standard spring-lever seat as fitted to a disc or mower. Although generally made with a fair margin of safety, a sudden bump over uneven ground or

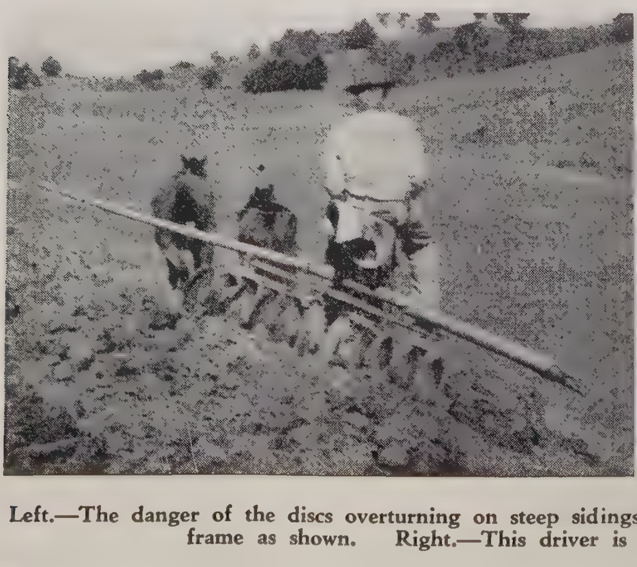
DEATHS.

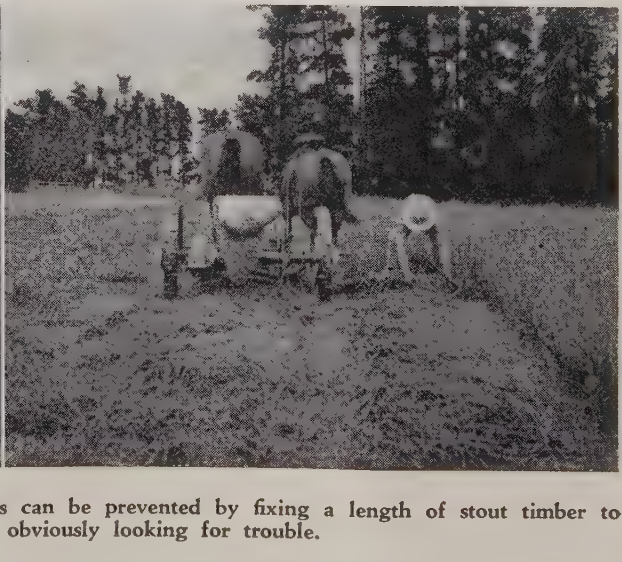
	1939.	1940.	1941.	1942.	1943.
Accident involving machinery	9	10	10	3	3
Fall from cart	—	—	2	—	1
Overturn of sledge	—	1	1	1	4
Fall from horse	2	—	5	9	—
Butted by sheep	1	—	1	—	—
Gored by bull	2	4	2	4	—
Tractor accident	1	3	4	4	8
Kicked by horse	—	6	2	—	1
Struck by falling tree	4	11	4	3	4
Pierced by hay fork	—	—	—	1	1
Electrocuted using electric clippers	—	—	—	—	1
Hay stack fell on man	1	—	—	2	1
Child's clothing caught in revolving shaft in milking shed	—	—	—	—	1

Left.—The use of mechanical equipment leads to many accidents in the harvest field. Right.—On shallow or loose soils the guy pegs require special attention, particularly if the ground has been softened by heavy rain.

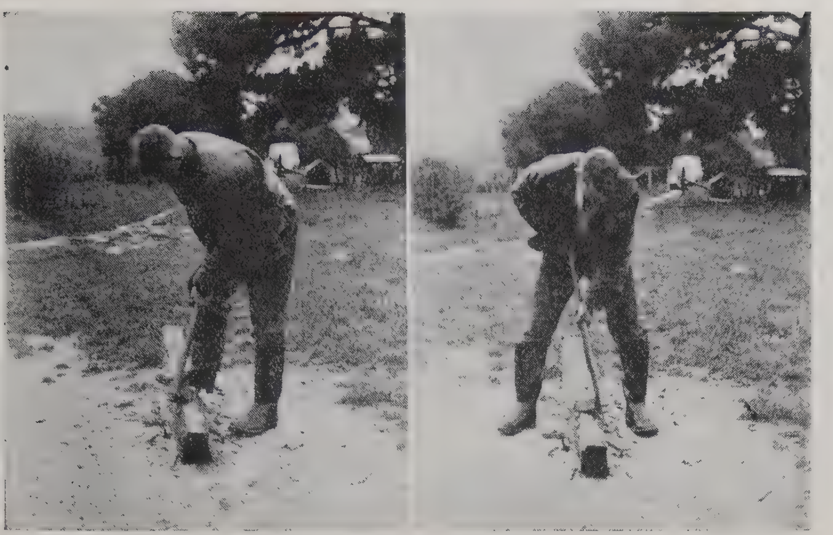


Left.—The standard spring lever seat commonly fitted to some machines is apt to be dangerous when climbing a steep incline. Such an accident due to a sudden breakage of the spring occurred here. Right.—The spring shown above suddenly broke with unhappy results to the driver. Note how the broken standard is utilised as a reinforcement.





Left.—The danger of the discs overturning on steep sidings can be prevented by fixing a length of stout timber to frame as shown. Right.—This driver is obviously looking for trouble.



Edged tools are apt to be dangerous. An adze or a hand grubber is very liable to glance and cause serious injury if carelessly handled.

Left.—Asking for trouble. Right.—A safe stance.

the additional strain imposed when climbing a steep incline is liable to result in a sudden fracture, particularly if the driver is of more than average weight. For this reason many farmers prefer to play safe by fitting an additional spring leaf as a reinforcement.

Tractor Accidents

It will be noted that the number of fatal accidents resulting from the use of tractors is high. Many such accidents no doubt result from errors of judgment in working uneven ground, and are due very largely to the personal element. Some, admittedly, are due to rearing of the machine—a combination of the personal element with faulty design of the draw-bar mechanism. Another common cause of injury, though usually not so serious, is being jolted from the seat through hitting an obstruction or uneven ground. Some drivers on this account favour a back rest for the seat. This gives additional security to the operator, but may prevent him from jumping clear in the event of a mishap. So, also, the practice of erecting a cab to give protection from the weather is apt to prove a serious danger to the operator if the machine is working under difficult conditions, and cannot altogether be safely recommended. Careless holding of the cranking handle with the thumb clasped round it is a fruitful source of injury in the event of a backfire, and frequently results in a bad sprain or a broken arm.

Like the tractor, the discs can be dangerous on a steep slope. The risk of overturning can, however, be readily overcome by fixing a length of stout timber transversely across the frame with the ends projecting well out on each side of the machine.

Beware of the Bull

Traditional experience, coupled with an occasional reminder in the shape of an obituary paragraph in the newspaper, does much to reduce the accident rate from goring. Farmers with long experience agree that even the most docile of bulls, irrespective of breed, should be labelled "dangerous." In fact, it is almost invariably the hitherto "quiet" bull which does the mischief. The bull which is known

Many bad accidents are caused by slipping on a steep, smooth concrete path in wet weather, particularly to anyone wearing muddy boots. It is a simple matter to impress a barred pattern before the concrete sets.

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to be temperamental is treated with due respect, so that danger is not invited. It should be remembered that no bull is absolutely safe all the time, and that it is never wise to take undue liberties. Various recipes for taming a fractious bull, such as dehorning or throwing with a rope, are sometimes favoured. Unless the animal is particularly valuable, however, there is no doubt that the common policy of "getting rid of it" is at once the simplest and safest solution to adopt.

Felling Trees

Readers will have noted the relatively high accident rate resulting from falling trees. Such accidents are partly due to the personal factor in that familiarity breeds contempt, and must to some extent be regarded as hazards incidental to this class of work. As in warfare, casualties are to be expected, and the worker can do no more than use the precautions commended by common sense. The rest depends on providence.

List a Long One

The list of potential accident sources is a long one, and could be extended indefinitely. There is the scrap of wire left lying to provide future trouble for someone, or the scythe carelessly laid aside instead of being hung up out of harm's way. There is also the dangerous naked light in too close proximity when filling a fuel tank—a simple but nevertheless a common cause of mischief. Everyone also is familiar with the gun which, too late, proved to be loaded after all. Obviously, most accidents in the above category need not have happened. They are inevitable only when carelessness sets a trap, as when the fork left sticking lightly in the ground gradually falls backwards with the prongs projecting at an angle scientifically designed to stab the unwary foot. There it lies, a patient and malignant trap. Almost inevitably, it will catch a victim some time.

Accidents may happen in very simple ways. A fork left sticking lightly in the ground is apt to fall over backwards and provide a trap for the unwary foot.

Foresight Needed

That some types of accident are always liable to occur is true. When working with sharp-edged tools some risk is necessarily accepted, and this obviously applies also to various other branches of farm work. In the main, however, a careful study of the salient facts will generally show that with reasonable care most accidents might have been prevented.

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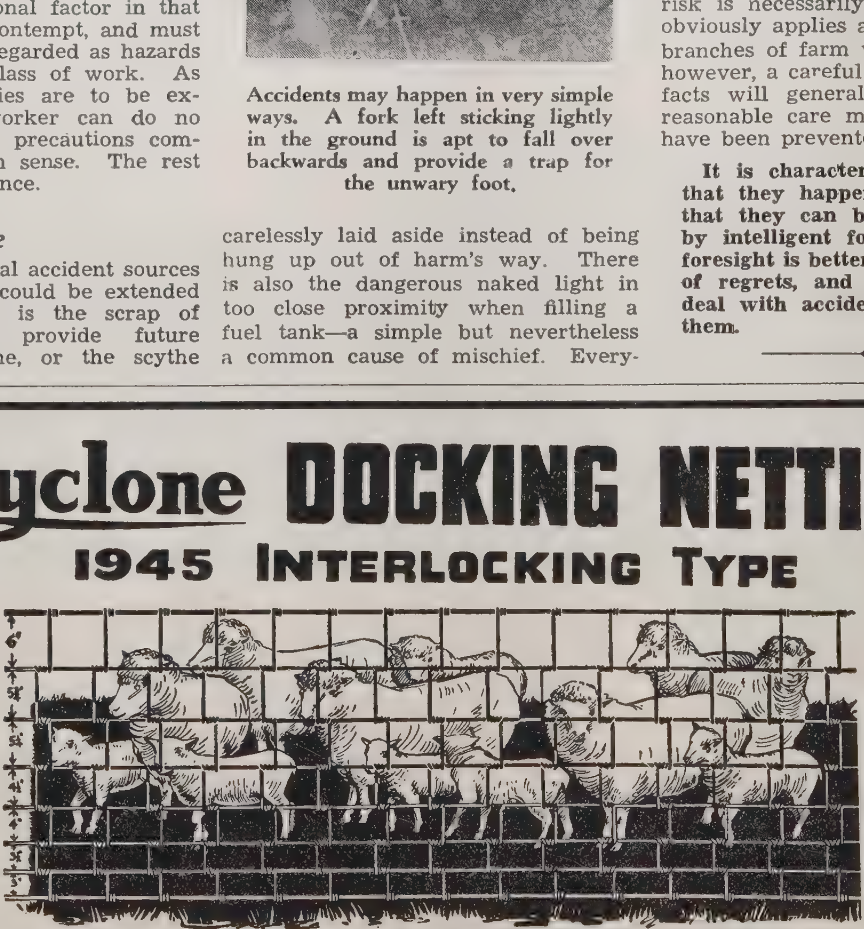

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MOLE DRAINAGE

Above: A typical area at Colyton showing mole drainage in progress.

For many years the mole drain plough has been used in the Manawatu, Rangitikei, and Woodville districts of the Wellington Province in an endeavour to improve cheaply the drainage on extensive areas of the heavy loam soils which overlie stiff, impervious clay subsoils in these districts.

By
C. J. HAMBLYN,
Fields Superintendent, Palmerston North.

THE bulk of the land on which mole drainage has been practised consists of rolling and flat-topped low hill country bordering the river flats and river terrace land, and is dissected by narrow valleys and deep depressions. In other cases the land slopes away gradually from the general higher levels to wide, open valleys. Most of the land is ploughable.

Land Lies Wet

The soils are fertile, but without drainage the land lies wet and cold in the winter and spring, and there is a marked tendency to reversion of pastures to dominant browntop. Rushes are a serious problem, foot-rot is bad in sheep, pastures are badly poached by cattle in the winter, and spring growth is backward. The wet winter and spring conditions also seriously affect the value of this land for the production of cereal and root crops.

Effective drainage can bring about a remarkable change in these conditions, and illustrations 2 and 3 are no exaggeration of this change. Because of the type of subsoil this land is ideally suited to mole drainage. However, mole drainage has often given disappointing results from the point of view of lasting improvement, due chiefly to serious faults in the methods used both by contractors and farmers, with the result that well-established farmers have resorted eventually to the much slower and more expensive method of tile drainage.

On land where the stiff, impervious clay subsoil comes within less than 12 to 15in. of the surface, mole drainage (with the drainage channels spaced a few feet apart) can be much more effective in rapidly removing rain water through the soil than tile drainage where the usual spacing of the tile drains is from one to two chains. A good mole drainage system can be put in at a fraction of the cost of tile drains, and in addition to being more effective, because of the closeness of the drains, there is every reason to believe that a mole drain system properly put in will last at least as long as the tiles in really suitable conditions.

PRACTICAL FARMER'S METHOD.

Mr. Bruce McLeod, of Colyton, near Feilding, has developed during the past 20 years a method of mole drainage which is very efficient, is practical, and, what is most important, has proved lasting under conditions on his farm which are similar to those on many thousands of acres of land

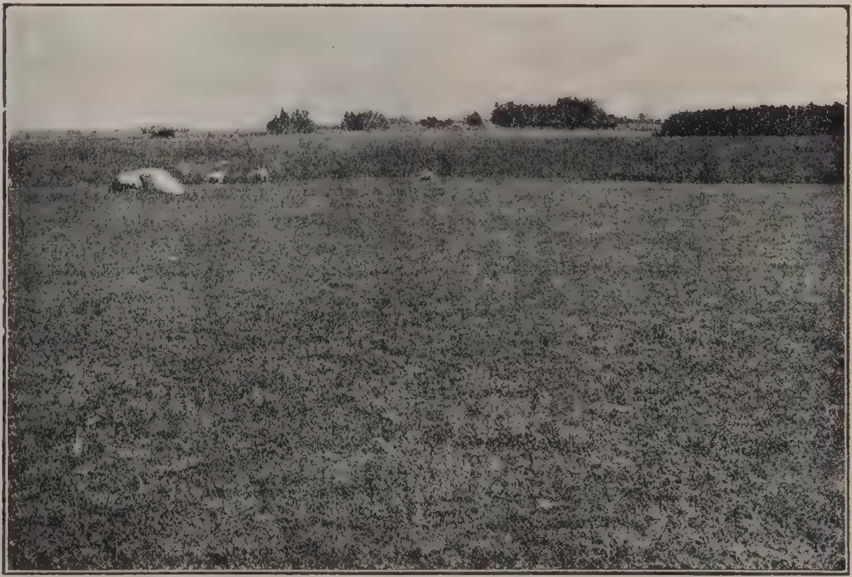
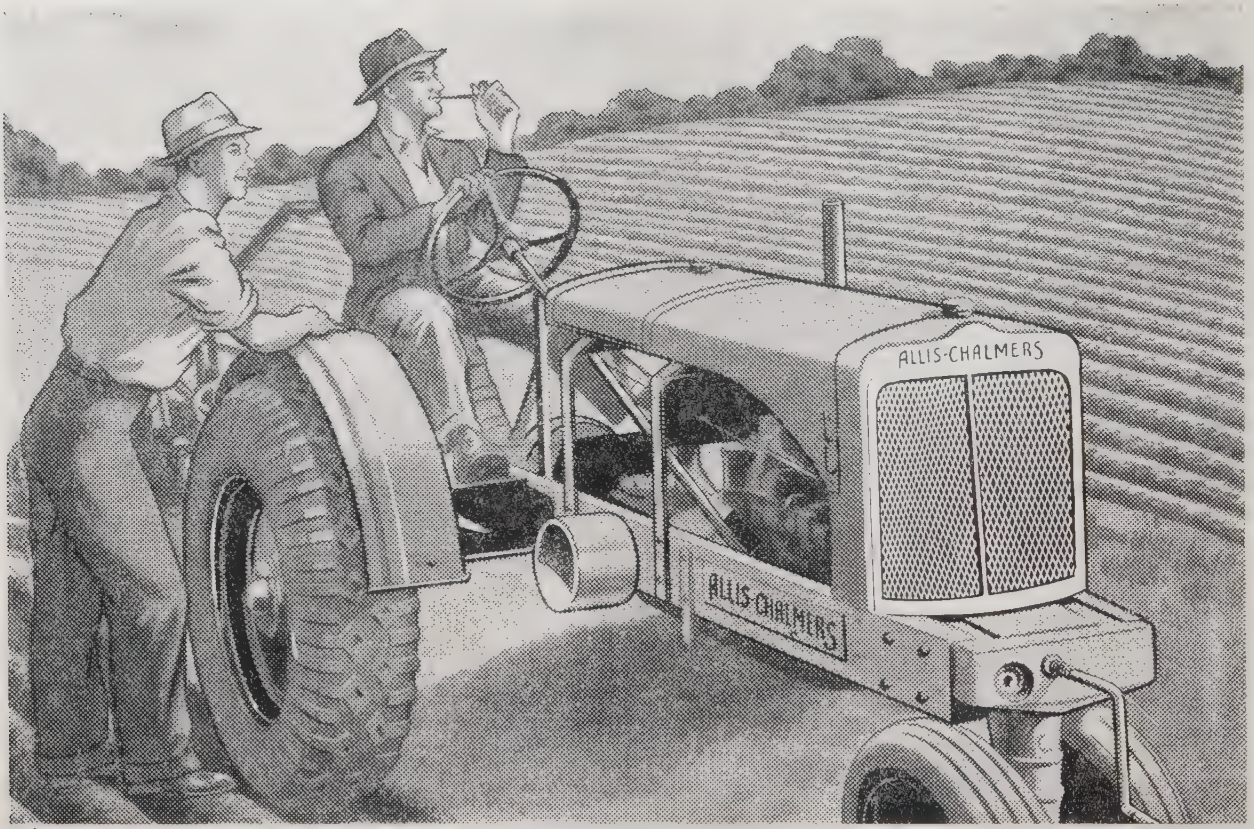


Fig. 1.—**Successful mole drainage. Portion of 400 acres of rush-covered browntop pasture converted to first-class grassland by Mr. Bruce McLeod, Colyton.**



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underlain by stiff clay subsoils in the Wellington Province and in other parts of New Zealand. The guiding principles of Mr. McLeod's method, though simple, are yet of extreme importance in successful mole drainage. First, there is the provision of permanent protected outlets; second, the provision of a definite and uninterrupted fall from the highest point of each mole drain to the outlet, with the mole drain generally travelling across the steepest fall; and, third, the provision of a sufficient pressure of water near the outlets to clear the system of silt at the commencement of the rainy season.

It has been found that the actual mole drain will last for many years when drawn in a suitable clay subsoil, but it is the gradual accumulation of clay and silt in the drainage channels which eventually blocks them and renders them useless. In very dry summers, especially, the soil dries out down to the mole drains, the sides of which flake, leaving a deposit of clay which can be cleared out of the system only by a good pressure of water through clean outlets. The silt cannot be cleared if the outlets are blocked, if junctions between minor drains and outlet drains are not clear, or if the fall is too little to give a good pressure of water. There is a special tendency for silt to gather in depressions, and this is the reason for maintaining a steady but definite fall throughout the course of each drain.

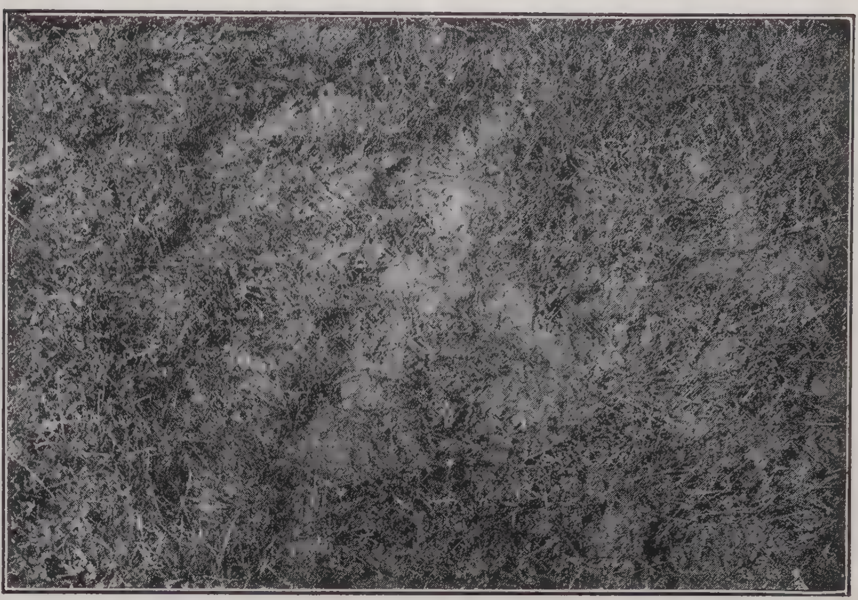

Fig. 2.—**Typical winter conditions on undrained land at Colyton. Wet, soggy soil fit only for browntop and rushes.**

Basis of Method

Mr. McLeod has now mole drained some 400 acres of the homestead portion of his farm at Colyton, all but one paddock having been done with the method described and illustrated here. The method is based on the experience with a paddock mole drained some 19 years ago in which a number of mole drains were connected to a single outlet drain drawn at the same depth. The clay blockage resulting from the crossing of the first-drawn blind-end drains by the outlet drain at the same depth was cleared by digging down over the junctions, taking out the clay plugs by hand, covering the cleared junctions with pieces of totara slab, and replacing the soil in the hole. This paddock, after 19 years of very satisfactory drainage, is now showing wet patches, though many of the outlets still function well.

The new method is a modification and improvement of the above, and the first paddock so drained was done some 12 years ago. A recent inspection of this paddock showed that the drainage was still remarkably effective, with no signs of deterioration in the pasture. The many other paddocks mole drained in the same way over the past 12 years also serve to demonstrate that the care taken in planning the mole drain system and in making clean junctions between the subsidiary mole drains and the outlet drains is well worth while.

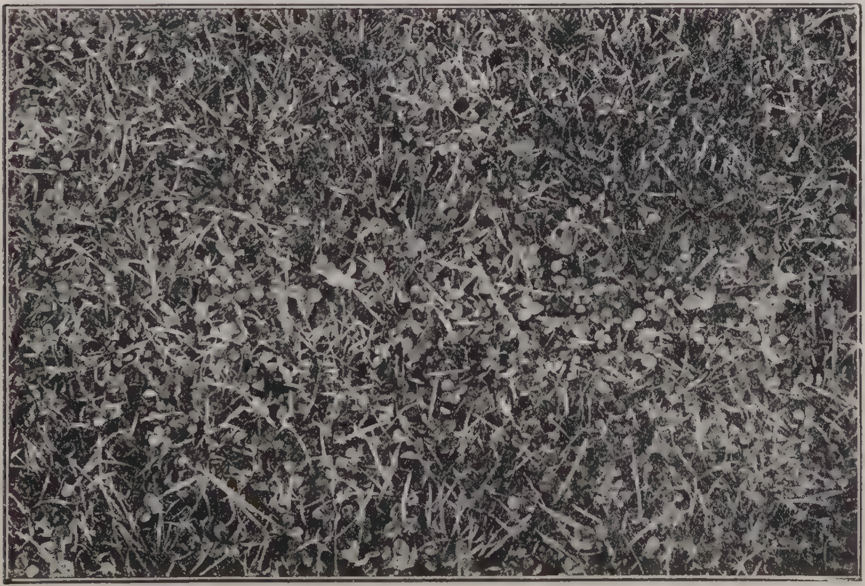

Fig. 3.—**Effect of mole drainage. The same land as shown in Fig. 2. Mole drainage has made it fit for thriving perennial ryegrass and white clover.**

Features of System

The chief features of the system are:—

1. **The elimination of the usual large number of individual mole drain outlets which are so liable to blockage. This is done by using one in every four to eight or more mole drains as an outlet for the group, and the gathering of several of these outlet drains to discharge at a suitable selected place where a permanent tiled outlet can be put in.**
2. **The connection of the subsidiary drains to each outlet drain by means of a clean unobstructed junction allowing the free passage of water from one to the other.**
3. **The connection of outlet drains to a short tile drain outlet so that the main outlet is covered and protected.**
4. **The mole plough is pulled to and from the outlets, thus saving empty running.**

Whereas in his earlier work Mr. McLeod endeavoured to run the drainage from as great an area as possible to the one outlet, experience indicates the advisability of limiting the area discharging at any one outlet to from three to four acres. The pressure of water from larger areas is liable to cause scouring either in the outlet or on the slope below it.

Layout of Scheme

In laying out this scheme of mole drainage a study is made of the paddock or area to be mole drained, particularly when heavy rain has fallen, and in addition to the selection of suitable locations for outlets, which are marked, the run and line of the mole drains is roughly schemed out. The number and location of outlets is worked out in relation to the general lie of the land, keeping in mind the desirability of limiting the area discharging at each outlet to some 3-4 acres and also limiting the length of the mole drains as far as possible to a maximum of about 10 chains. These limits are recommended by Mr. McLeod as a result of his experience.

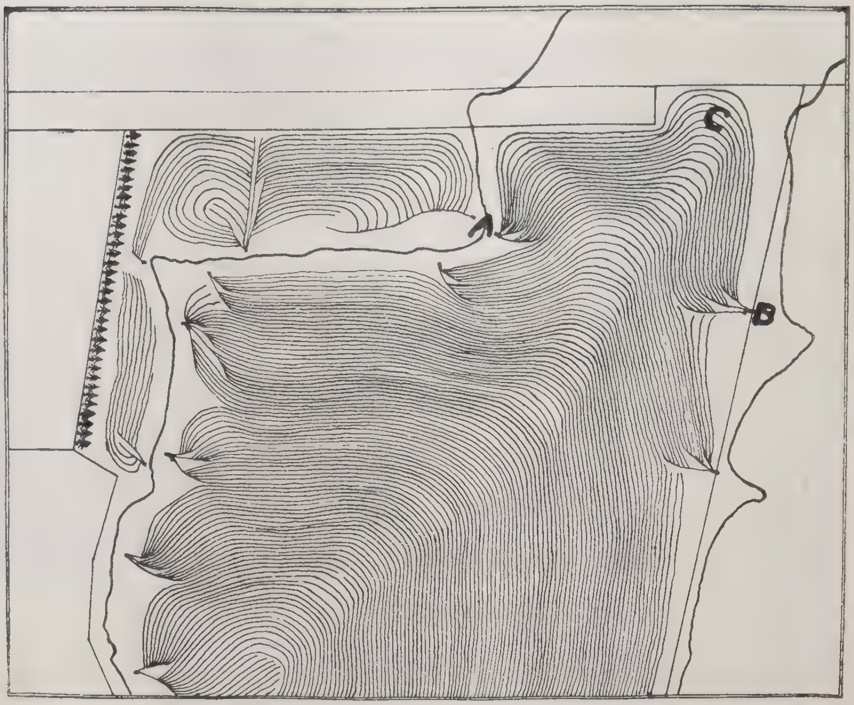

***Fig. 4.*—Sketch plan of mole drain system on a 32-acre paddock showing the method of gathering mole drains to discharge at a few selected points.**

He has also found that mole drains are most effective when they run across the steepest slope and are less likely to scour, but he aims always at a definite fall throughout the length of each drain, with a more decided fall if possible near the outlet. A dumpy or other form of level is very useful in working out the amount and direction of the fall. The drainage of such country as that at Colyton, gently rolling for the most part, with steep slopes to watercourses round the edges of the paddocks, lends itself admirably to the methods developed, but it is surprising how the same system of collecting mole drains to discharge at selected outlets can be adapted to varying conditions in different types of country.

Fig. 4 illustrates the layout of a system of mole drainage on part of a 32-acre paddock, one of the first drained with the new system. The main portion of the drainage system crosses a low ridge running from the lower left hand corner up to the point marked "C" on the plan. The drains were drawn parallel as far as possible, about 6-9ft. apart and across the steepest slope from the ridge to the edge of the gulleys indicated by the winding streams. The mole plough worked away from an outlet as at "A" on one side of the ridge over to another outlet shown at "B," and so on down the paddock. The plough was continually in the ground except when pulled out for the turn at the outlets. Each group of subsidiary drains is cut near the outlet by an outlet mole drain which is directly connected to the tiles in the outlet trench and to each of the subsidiary drains by methods explained in detail later.

The flexibility of the system is shown by the way odd corners are dealt with, and the economy in tractor time effected by making full use of the fall to both sides in this field by running across the ridge to outlets on either side should be noted.

Drawing the Moles

Fig. 5, which is a sketch plan of a system of mole drains using the McLeod method in the drainage of some 3½ acres, part of a field at Bunnythorpe, will serve as a basis for the detailed description of the procedure in drawing the mole drains and con-

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necting the subsidiary drains to the outlet trench. XY is the short curved outlet, in this case about 10ft. long. The trench is curved to give direct access to the outlet mole drains on the one side for ease in connecting them to the tiles to be laid in the trench.

The general line of those mole drains which are to serve as outlets is marked out with pegs from the trench into the paddock, particular care being given to the line of that portion where the subsidiary mole drains will cut each outlet drain. The subsidiary moles should cut the outlet moles at between 45 deg. and 75 deg. With sharper angles difficulty in making a connection between the two will be experienced, and with wider angles there is not the same smooth line of flow of water from one to the other.

Having marked out the line of the outlet mole drains, or at least the first one or two, as at OP and QR, the mole plough is set up at A near the outlet trench about 12-15ft. from the line of outlet mole OP. This distance is necessary to allow the plough to penetrate from the surface to the full working depth before crossing the outlet mole. The plough follows the line AB to the outside of the area, where it is tripped and turned to enter again at C about 6-9ft. from B to draw the second subsidiary drain CB. At B, just after crossing the line OP, the plough is tripped, coming straight out of the ground. It is then set up again near A to draw the third subsidiary, and so on until the group of subsidiaries to cross the outlet OP are all drawn and all the land outside OP is drained. The method of gathering the drains to about 2-3ft. apart at the point of crossing the outlet drain line should be noted. This is necessary to leave room for the number of moles to be gathered towards the outlet, since it is desirable generally to have the junctions as near as possible to the outlets. The method of giving a slight turn to the ends to give a better angle of crossing for the outlet moles is also worthy of note, as this tends to save working space.

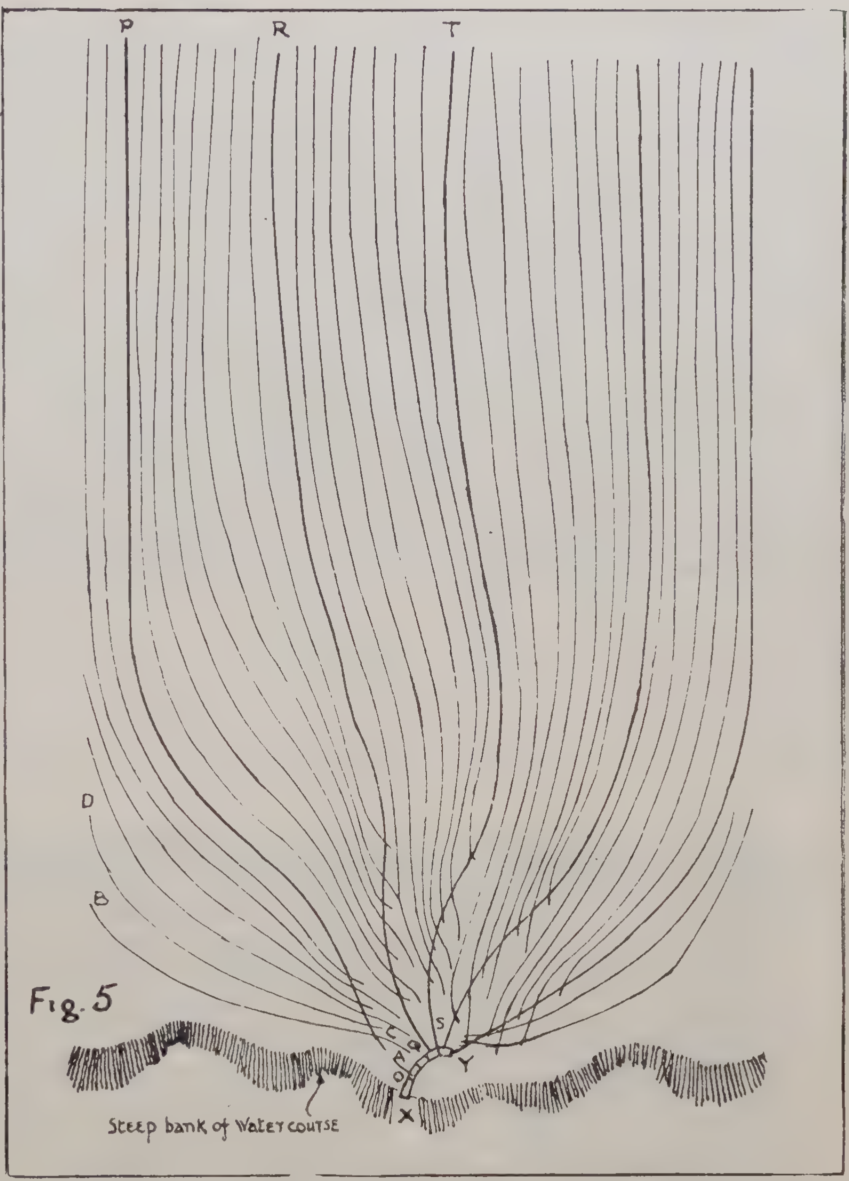

Fig. 5.—**Plan of mole drains showing method of drawing moles to an outlet and connecting groups of drains by single-outlet mole drains. This system drains an area 4½ chains by 7 chains to one outlet.**

When the group of subsidiary moles with blind ends are drawn the plough is next placed in the trench XY as at O, and is then drawn at the same depth, or at most about 1in. deeper, to cut across the subsidiaries at an angle of about 45 deg. to 75 deg., and is continued as an ordinary mole drain.

The plough next returns to the outlet, drawing the first of the next group of subsidiaries to cross the line of the second outlet mole drain QR. So the work proceeds across the field until all the area to be drained to the one outlet is dealt with.

Connecting Subsidiaries to Outlet

Mr. McLeod considers the provision of a clean, full-bore connection between the subsidiary mole drains and those acting as outlet drains to be the most important part of his method. Of several methods for making this connection which he has tried Mr. McLeod finds that illustrated and described here to be the best.

In crossing the subsidiary drains already drawn with the mole plough at the same depth a solid plug of clay is driven by the torpedo as it passes into the ends of the subsidiary moles, thus completely blocking them. These

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clay plugs must be removed if the system is to function properly.

Figs. 6 and 7 show the method of removing these plugs so that the water is free to flow from the subsidiary into the outlet mole drain and thus to the outlet trench. The point where the knife cut of this outlet mole drain crosses the line of the knife cut of each subsidiary is pegged in each case. With a spade a hole is dug as shown in Fig. 6 on the blind side of the subsidiary and about 4in. from the knife cut of the outlet drain, down to the mole channel, which is exposed. The corkscrew implement shown in Fig. 7 is then placed in the line of the mole channel and screwed into the first clay plug, which is pulled out as a cork with a corkscrew. When this plug is cleared and there is water in the ground a flow of water from the outlet mole drain may come into the spade hole. The second plug is next removed and by working the auger backwards and forwards quietly a few times the hole can be cleared to a good size. When the subsoil is moist and the drains are functioning the removal of the second plug is followed by a rush of water into the spade hole.

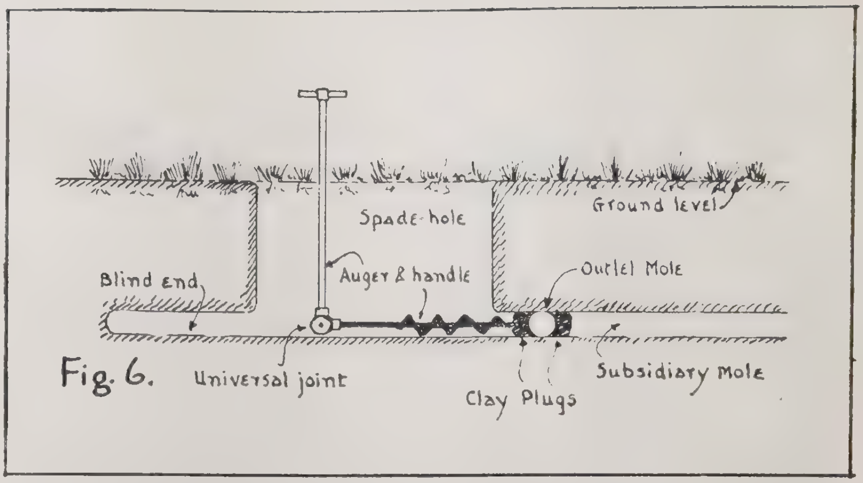

Fig. 6.—Diagram showing the clay plugs which are forced into the subsidiary mole drains and the location of the spade hole which is dug to allow the use of the the auger to remove them.

When satisfied a clean junction has been made a good lump of clay should be worked up and firmly plugged into the opening in the side of the spade hole so that the water from the subsidiary is diverted into the outlet mole drain. The spade hole is then filled in and turf replaced. The whole series of subsidiaries is in turn connected up in this way with the outlet mole drain.

When the land is dry and water does not enter the moles soon after pulling this work can be left to be completed after the tractor work is done, but where water rapidly collects in the drains it is advisable to make the connection as soon as possible after

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the drains are drawn. Two men can keep up with the tractor in this work as well as assisting with the mole plough at the turns.

Permanent Outlets

The final process is the laying of tiles in each outlet ditch to give a permanent protected outlet for each group of mole drains. Mr. McLeod in his larger paddocks prefers 4in. unglazed drain tiles, but where the area draining to the outlet is about 1 to 2 acres a smaller tile, say 3in., can be used. The bottom of the trench is carefully graded and is built up with damp clay so that the line of tiles will be close up to the line of the mole drain outlet holes. The tiles are fitted into the trench, and at the place where each outlet meets a tile is marked. Holes are then cut in the tiles as marked so that the water can run directly from each outlet mole drain into the tile opposite it.

The holes in the tiles are chipped round with the small tool shown in Fig. 8. This is made from a section of a mower blade fitted with a short handle and is also very useful in cutting tiles to any length. The piece of tile which is chipped round is easily knocked out with a hammer, leaving a hole which should be made large enough to take a 2½in. tile.

If the line of mole drain outlets is uniform, as it should be, the holes in the tiles are fitted against the mole drain holes in the bank of the ditch and wet clay is carefully packed tight around these junctions and also over the joints in the tiles, which are carefully fitted and bedded as shown in Fig. 9. If necessary, short lengths of 2½in. tile can be fitted into the ends of the outlet mole drains and connected to the tiles through the holes referred to above, the same procedure being followed in packing wet clay over the junctions and along the sides and over the joints of the tiles to prevent the pressure of water from scouring out the tiles. When the outlet moles are connected to the tiles the trench is filled in to complete the outlet.

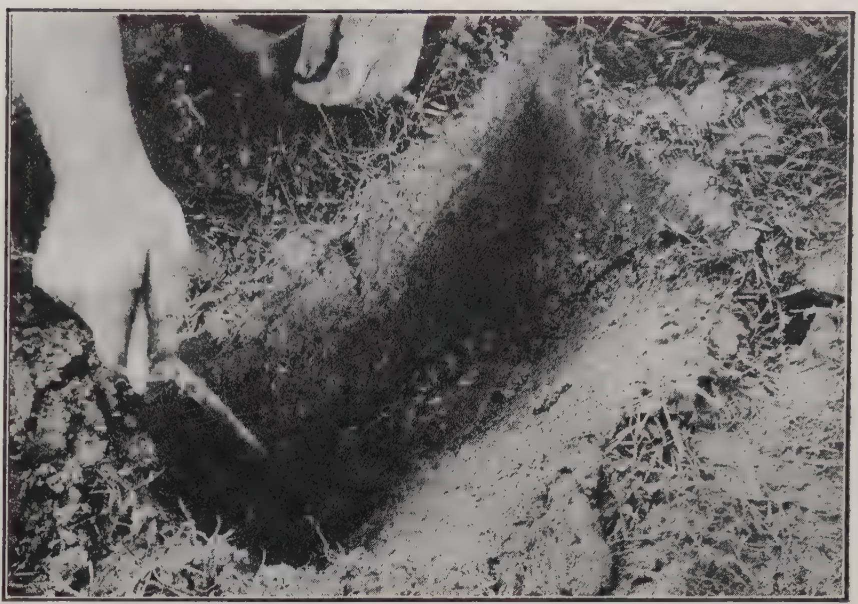

***Fig. 7.*—Connecting subsidiary mole drains with outlet moles. The spade hole is dug down to the mole drain channel and the corkscrew auger is in position to remove the clay plugs. The auger is fitted with a universal joint.**

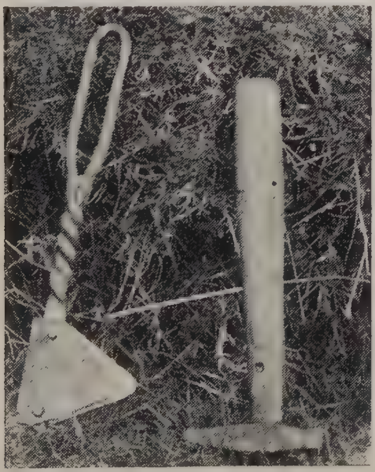

***Fig. 8.*—Tools for cutting tiles. Left, a section of mower blade, with handle, for chipping the outline of holes and cutting tiles. After chipping has been done with the mower blade holes are knocked out or pieces removed with the hammer.**

Although the permanence of such outlets has been stressed, the renewal of the mole drainage system at any time this may become necessary requires only the digging out and lifting of the tiles at each outlet, when the same outlets can be used for the new system.

Costs of Mole Drainage

Detailed costs have been kept by Mr. McLeod for the mole drainage of various paddocks on his property, but these have varied so much, due to variations in cost of fuel, oil, tiles, and wages, that a line on costs can best be given by quoting the actual tractor hours, man hours, and materials, such as tiles, required for the complete mole drainage of the 32-acre

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paddock from which many of the illustrations in this article were obtained. This area was mole drained in 1937, the moles being 6-9ft. apart and 18in. deep.

Tractor and tractor driver hours .	29
Man hours making outlets and connecting mole drains	58
Man hours tiling and filling in outlets	16
Tiles for outlets	85

Mr. A. W. Hudson, of Massey College, in his bulletin No. 11 on mole drainage in New Zealand quotes costs as given to him by Mr. Wm. Busch, Martinborough. The costs of mole draining 34 acres in 1940 by the McLeod method with drains 6-9ft. apart and 18in. deep, using a 3in. plug, show the following tractor hours, man hours, and materials used:—

Tractor and tractor driver hours, 26.
Man hours digging junctions and outlets, 72.
Man hours taking levels, 2.
Tiles for outlets, 350.
Man hours tiling outlets, 37.

From the above details an estimate of the present-day costs of mole drainage by the McLeod method can be readily worked out. In 1937 Mr. McLeod's 32-acre paddock cost 10s per acre, and the 34 acres quoted by Mr. Hudson 14s. 9d. per acre.

Because of the relatively large areas quoted and the fact that the men doing the work were experienced in this method, the tractor hours and man hours given above are likely to be less than those required under average conditions. However, where farmers themselves select the outlets, have the outlet trenches dug, and the scheme of mole drains laid out before the tractor comes on to the scene a fair estimate of the cost could be based on one tractor hour per acre for drawing the moles and two to three man hours per acre for digging outlets, connecting up mole drains to outlet drains, and tiling and filling in of outlets. The number of tiles required may vary considerably and is dependent on the number and length of the outlets required.

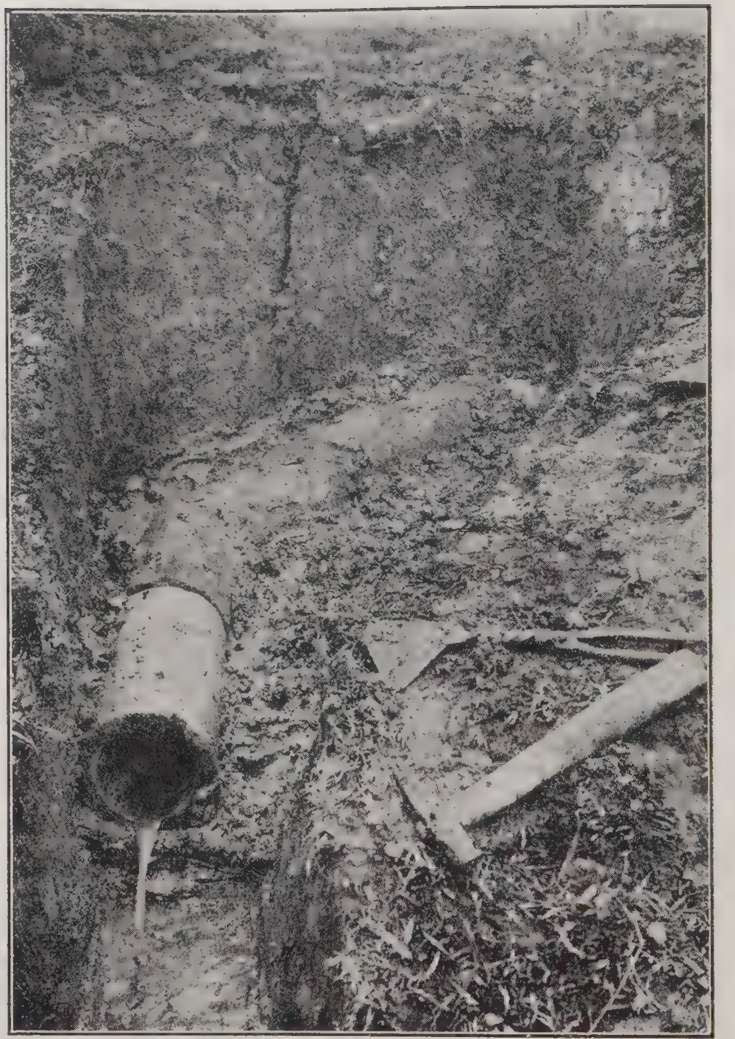

Fig. 9.—Tiles laid in outlet trench ready for filling in. Note the clay plastered over junctions of tiles with moles.

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Scope of Mole Drainage

The essential conditions for satisfactory and lasting mole drainage are:—

1. **A suitable stiff clay subsoil free from obstructions such as ironstone pans, roots, or large stones, which would interfere with the drawing of the mole drain plough through the soil.**
2. **The stiff impervious subsoil must be within 20-24in. of the surface, as this is the maximum depth for the usual plough. Mole drains up to 30-32in. can be drawn with special ploughs and heavy tractors.**
3. **There must be an appreciable fall in the direction of the mole drains if the drains are to last.**

On relatively flat land mole drains do not generally last long, as they tend to silt up, but such drains are often well worth while putting in because of their effectiveness while they last. On the other hand, it is unwise to take mole drains down too steep a slope, a fall of 1 in 7 to 1 in 10 being about the limit in this direction, because of the liability of the drain

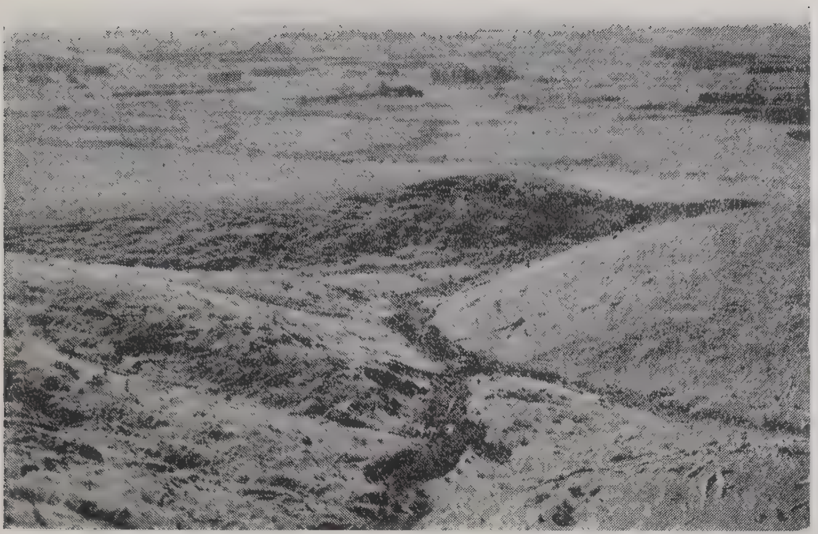

Fig. 10.—**Manawatu clay country sloping away from foothills—ideal conditions for mole drainage.**

channels to scour. As already stated, on steep slopes the mole drains should be taken across the slope as much as possible.

There are many thousands of acres of country in the Manawatu, Rangitikei, Southern Hawke's Bay, and the Wairarapa with conditions almost ideal for effective and lasting mole drainage. Fig. 10 is a typical illustration of such country. In many other districts, particularly North Auckland, Southland, and the foothills of Canterbury, the stiff clay soils can be drained and improved by mole drainage. The mole plough is, however, not effective in relatively loose soils where the drainage may be bad on account of the flatness of the land as a whole or because of a pan formation in the subsoil.

Mole and Tile Combination

The McLeod method of mole drainage can be readily combined with tile drains to extend the scope of mole drainage to areas where no suitable outlets for mole drains can be arranged otherwise. A common practice in combining mole drainage with tiled outlet drains is to lay the tiles generally with some free-draining material over the top of the tiles and to proceed by pulling the mole drains backwards and forwards across the tile drains. This method gives satisfactory results for a time, but since there is no direct connection between the mole drains and the tiles, there is no outlet for any clay or silt falling into the moles, which gradually accumulates and eventually blocks them.

There is no difficulty in gathering the mole drains by the McLeod method to selected points along the course of the tile drains where a proper tiled junction between the mole drain outlets and the tile drain can be made so that the whole system of mole drains and tile drains is connected up with a free passage for the water (which may often be carrying clay and silt) from the beginning of each mole to the outlet of the tile drain. The use of tiles to give a satisfactory outlet for a mole drainage system is often necessary to deal with paddocks where the mole drains would have to be too long to carry the water from one side to another, or where the slope in one direction is too great to take mole drains down safely, whereas a tile drain can be taken down the slope on an angle, and the mole drains can be drawn across the slope from either side. Tile drains are also useful to give a permanent main outlet for paddocks where the fencing or a shelter belt prevents access to suitable places for outlets.

Mr. McLeod is at present mole draining a 24-acre paddock which slopes two ways by putting a tile drain across the middle and down the main slope. The purpose of the tile drain is to reduce the length of the mole drains necessary to reach the top half of the paddock. The tile drain will be laid with junction pipes at the points on either side selected along its course for the mole drain outlets. The mole drains will be gathered to these outlets where short side trenches are dug to take the mole plough when pulling the outlet mole drains across the blind ends of groups of subsidiaries. The outlets are then connected to the tile drain by means of the usual short length of tiles laid in these trenches. Mr. McLeod is quite definite that the trouble taken to make this clear connection between the mole drains and the tiles is well worth while. To renew the system, which he does not expect to have to do in the next 20

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years, the short trenches will be opened up and the mole drains drawn again to the same outlets.

McLEOD METHOD RECOMMENDATIONS.

Type of Plough

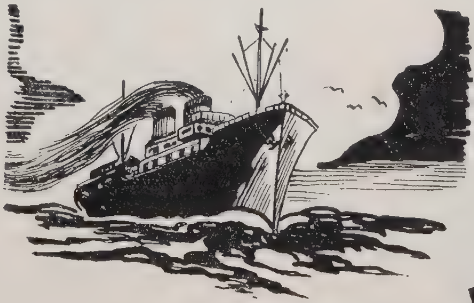
The light, easily-adjusted mole plough of the type illustrated in Fig. 11 is favoured. This is a tractor-drawn implement in which the depth is adjusted firstly by shifting the blade up or down relative to the frame, and secondly by changing slightly the angle of the blade and, therefore, the point of the torpedo relative to the line of draught. The first allows for major alterations and the latter is for small adjustments. The implement tends to run on an even line, the depth being unaffected by slight surface depressions or humps. The blade can enter when set up on the surface to the full depth in a matter of 10-12ft. and at the end of a run by tripping a stay in front of the blade (which serves also to alter the depth) the plough comes out of the ground with the blade in position ready for turning. A plain 3in. plug is used. Larger plugs are liable to fracture the clay too much so that the water in its passage to the mole breaks down the sides and top.

Depth of Drains

A minimum depth of 12in. with the plug working at least 2-3in. in the clay subsoil is recommended. Mole drains nearer the surface are likely to be affected by dry weather causing the sides to flake. There is also the danger of damage to the drains by heavy cattle in wet weather or by the plough. On the other hand, it is not advisable to go too deep into the clay, since the best moulding clay is found in a layer about 2-6in. below the start of the true clay. Mole drains drawn too deep may be placed in a less suitable type of soil below the best clay, and further the surface water will enter deep drains less freely than shallower ones. A depth of about 16-18in. is the rule on Mr. McLeod's property.

Time to Drain

Though hard-and-fast rules cannot be laid down, mole drains should be pulled when the surface is relatively dry and the subsoil is wet and in



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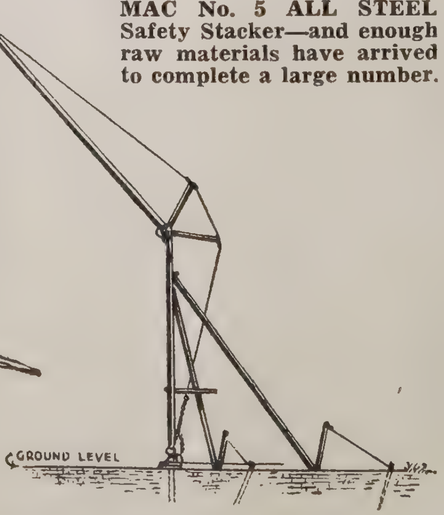

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good moulding condition. The dry surface means less cutting about and more effective pulling power of the tractor. The wet subsoil ensures less draught and good, clean mole drains. On no account should mole drainage be attempted when the ground is sodden with water and large areas of surface water are lying about. The rapid filling of the knife slits with excess water from the surface soil soaks and softens the plug of clay forced into the bottom of the slit by the passing mole plug and the roof of the drainage channel is very liable to collapse and fall to the bottom, blocking the channel.

Another cause of the rapid collapse of mole drains which sometimes cannot be foreseen or avoided is very heavy rain soon after the drains are drawn. The rain water enters the knife slits and softens the roof of the mole channels, resulting frequently in the breakdown of the mole drains.

Dry surface conditions with good moist condition of the subsoil clay generally occur more frequently in the spring than in the later autumn or winter, and for this reason Mr. McLeod, like many other experienced mole drainers, prefers to plan this work for about September or October. There is, in addition, less likelihood of very heavy falls of rain in most districts about this time, though this is not at all certain.

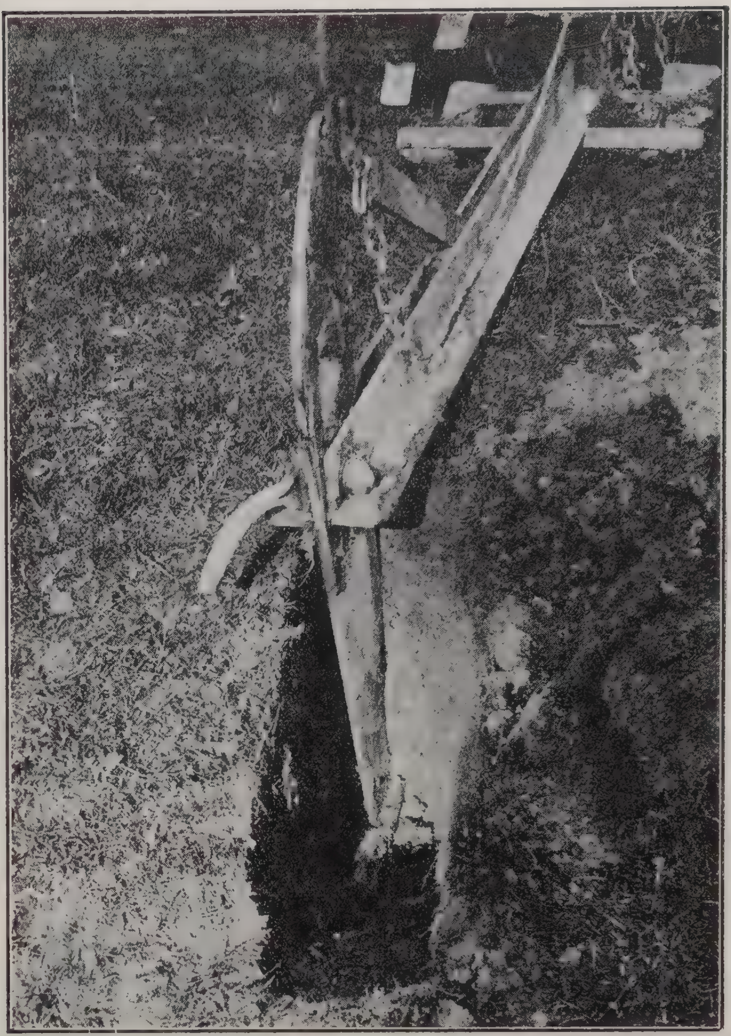

Fig. 11.—**Light, easily-adjusted mole drain plough. Note release on end of stay at top of blade. A pull from the tractor driver releases the stay and the blade swings up out of the ground.**

Other points recommended by Mr. McLeod as a result of his experience include limiting the speed of the plough to $2\frac{1}{2}$ to 3 miles an hour. With too great a speed there is a tendency to draw in the sides of the mole channel after the plug, or for the sides to flake when the soil is on the dry side. Depressions should not be crossed; it is better to keep an even fall by passing round them if possible. It may be necessary to have a series of mole drains two or three feet apart alongside a depression so that the drainage on either side can be effected with mole drains at the correct spacing. A spacing of 6-9ft. is generally used, but for very wet areas with little fall a spacing of 4ft. is more effective. Mole drains down a slope need to be closer than those taken across the same slope. Marked changes in the fall should be avoided except near the outlets, where an increase in fall is preferred if it is possible.

Conclusion

The method of mole drainage described in this article is confidently recommended to those practising mole drainage under similar conditions, and farmers particularly are recommended to consider the possibilities of the mole plough where good drainage is required.

The writer wishes to record his thanks to Mr. McLeod for making available the practical details of his methods and the results of his experience in mole drainage.

◆

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Feeding neighbour's milk out of drums, to tank, and piped to trough.

Pig Production on a One-man Farm

PIG meat production is not reaching the amount scheduled for this season, and farmers are being asked to make every effort to increase production in the future. The following article describes the practices of a farmer on a 53-acre dairy farm, who has increased his returns from pigs from £50 to £270 in six years by producing annual crops for feeding and purchasing surplus separated milk.

By A. T. SHANNON, *Field Economist, Hamilton.*

THE man who runs his dairy farm with no other labour than his own generally finds the demand on his time is the greatest hurdle to getting more out of his pig production. When cropping is undertaken for wintering pigs this difficulty may be increased, unless matters are carefully organised. Mr. Len Smith, of Horsham Downs, Waikato, whose experiences are described here, is firmly of the opinion that the best returns are shown from wintered pigs, and his practices will interest all those who are anxious to enquire into the reasons for successful pigkeeping.

"Coming from the King Country six years ago, I thought I knew a lot about farming," he said, "but I found out different. Pigs died right and left, and the profit was pretty small to start with. To know then what I had to find out subsequently the hard way would have made things decidedly easier in those days when I was struggling to get established. If other farmers can profit by my experiences, well, here they are."

This 53-acre farm carries 40 milking cows, which last year produced over 11,000lb. butterfat. Six years ago the total sales of pigs did not reach £50. Last year this figure was £270, and the outlook this year is still brighter.

Baconers (wintered pigs) ready to top off. Note unsuitable state of pasture.

Early Disease Losses

"My original Tamworth breeding stock proved to be an unsuitable strain for the particular conditions," Mr. Smith said. "The gully forming part of the pig run was wet and overgrown, and the pigs couldn't stand up to the conditions. I lost practically the whole first litters, 34 pigs, through disease and other troubles. That forced me to buy sows and store pigs in the open market, and I had to pay for that in big money and more disease. Those bought pigs were Berkshires, and they didn't turn out much better than the Tamworths.

"At least, I learnt an early lesson about buying pigs through the stockyards, and since then I haven't been back. It stands to reason that quite a lot of pigs are yarded simply because there is something wrong with them, and if you buy consistently, sooner or later you must get caught with a diseased pen. Luckily I was caught early.

"There were no crops for the pigs then. I was far too busy and inexperienced, and didn't understand local conditions thoroughly. The litters from the Berkshires were more successful than from the Tamworths, but all told there wasn't much profit. I had no holiday that year. Instead I built a layout in the then Waikato system, with inverted V shaped huts and fattening pens adjoining small grass runs. You can see the layout is on the warm side of the hill, dry and away from most of the winds. It actually cost me about £30 in cash, but it has been a handsome investment. The layout is a disgrace now, and this is its last year, so next season there will be something on more modern lines that will take advantage of my previous mistakes. It will probably run me into £90, even using most of the wire and totara posts again, but I know it pays dividends."

General view of layout in its last year illustrates what ought not to be—sties broken-down huts, rank grass growth; but excellent drainage and warm aspect. Crops to be grown this year in paddock in middle foreground. Last 3 years' crops were in the paddock partly shown in right foreground.

WE MUST
GROW OUR OWN BARLEY
THIS SEASON

40,000 acres of barley for pig feed and 38,000 acres of malting barley are required in 1945-46.

North Island farmers, handy to the dairying districts, are urged to grow more feed barley. South Island growers of malting barley should also step up their production.

In places where the climate is dry or the soil light, autumn sown barley gives best results. The land should be well cultivated and ready for sowing in April.

Where the soil is moist, spring sowing should be practised.

More Butterfat Needed

190,000 tons of butterfat are required in 1945-46. To produce this, thousands more cows will be needed. Retain all sound cows, wintering them with graziers, if necessary. Grow more feed crops and make the fullest possible use of animal manure.

In planning your cropping you are urged to consult your local Primary Production Council.

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The change to Berkshires proved to be an unhappy choice. Sold as weaners or porkers, the strain was suitable enough, but none could be carried on to bacon weights when circumstances were favourable for this. Sales rose to nearly £100, but obviously different stock was needed.

Fortunately, about this time a pig club had been started in the area, using a pedigree Large Black sow. From this club a boar was procured and mated with the Berkshire sows, with uniformly successful results. Here is what the farmer says: "I still use that boar and the same cross. In my opinion the crossbred pig is better than the straight breed. You get a good, strong-constitutioned pig that is hardy and thrifty, and is suitable for making either porkers or baconers."

Crop Feeding Started

The next year saw the almost accidental commencement of crop feeding to the pigs. It happened this way. "I had grown maize as greenfeed for the cows, and some that had been left over had got to the dried-up stage with quite a few ripe cobs. I fed this residue to the pigs in the paddocks in May and June, and took them on to bacon weights. The rate of growth of these pigs, their size, and the prices convinced me that there was more than talk in pig crops for winter feeding. In the following winter I had an acre and a quarter of crops specially for the pigs, and they worked in well with my system. I have 10 acres of pig-proof paddocks, and as the milk goes off the stores get more and more access to grazing. Then, according to conditions, I begin crop feeding, so that the milk is coming on as the crops are finishing off. At that stage I sty the best of the pigs to top them off on meal. You can see that once the pigs go on to crop feeding they carry right on after the crops with milk and meal, growing all the time, until they get away as baconers."

Grazing is an important item for the pigs on this farm. In fact a special area is shut up in autumn for the pigs alone to supplement the dwindling milk supply, which is helped along by molasses when procurable. The dry stock also are on grass, and are brought in, according to their condition, about two weeks before farrowing to get a small quantity of meal and milk. The feeling is that grass plays a big part in keeping the pigs healthy, and suitable pasture can in a large measure take the place of some of the more expensive methods of feeding.

Speaking of crops, the farmer made these comments: "I have grown my crops on the same land for three years now, but it will go down into grass this time. There used to be rough ground and blackberry in that spot, but the pigs soon cleaned up the roots. For the present cropping season I am going to cultivate the gully and bring it under control in the same way. I usually have the soil ready for sowing about the end of October, and broadcast the seed, though when it comes to cropping on level areas I will drill it. The rate of sowing is 30lb. maize, 1½lb. kumikumis, and 1½lb. cattle pumpkins for 1¼ acres, all broadcast and disced in. These crops are fed off in breaks, and I let all the store pigs in. Begun in June this gives more than a month of feed for 35 pigs until the milk comes in. As for weeding and worrying about crops, I sow them, manure them, and forget them. Last winter the yield was low, but the neighbour's cows came in early and saved the situation."

Neighbour's Skim-milk

This introduces another important aspect of pig production on this farm, and explains to some extent why sales are so high. There is an agreement with the neighbour to buy his skim-milk at £1 per cow from 44 cows. This price was paid at first with some fear as to whether it may have been too much, but all doubt has gone now. "I collect the milk once a day by tractor and trailer when the cream is carted to the gate. It takes me only a matter of minutes to load the milk and take it along to the 200-gallon tank by the store pig pens. Two 30-gallon troughs serve the store pig pens, and the milk is piped there from the tank. The neighbour's milk feeds the stores and mine goes to the fattening pigs. In the coming season I estimate the milk will cost £45, molasses and the little meal I buy won't run me into £35, leaving a substantial margin."

Meal feeding here is restricted to a minimum, a policy which would not find agreement with all pig producers by any means. "I can't see the economy in heavy expense of meal feeding," was the explanation. "Last year cereal meals cost me under £20, and, except for creep feeding on wheat meal, which I find excellent, because you get no scouring by using it, this cereal mixture goes to top off the baconers during the month or six weeks of sty feeding. The skim-milk is fed night and morning, with the meal at midday. This I put to soak in skim-milk in the morning, and never feed it dry." An interesting system applied to pigs is something similar to a rotation. Sorted up into pens according to size, these pigs are frequently drafted and moved along as the tops are selected for the period of sty feeding. Accordingly, there is less fighting and there are no big pigs to hog the milk at the expense of smaller ones.

Farrowing Programme

Farrowing records kept serve once again to emphasise the substantial litter losses in the first 10 days. Here are recent farrowings:

Sow.	Date farrowed.	Born.	Alive after 10 days.
Te Kowhai	June 12	10	9
Nellie	June 12	9	5
Sandy	June 15	10	3
Bib	Sept. 11	10	9
Bub	Sept. 11	10	8
		49	34

This litter mortality, as with young lamb losses, when put down in cold hard figures, presents a dark picture. While Sir Truby King methods are hardly applicable, it does appear that high piglet mortality offers a field for considerably reducing losses in pig production.

The farrowing dates show what arrangements have been made to utilise crops in winter to produce baconers in October and November. Whereas all sows used to be farrowed in August-September, three are now brought in during June, especially for baconer production, and the September farrowings fit in well with the peak of milk production.

Six baconers sold in October netted an average of £4/15/-, three sent to the works early in November were top grade, around 170lb., and averaged £5/9/- net. A further 10 heavyweights are ready to be marketed now. An interesting point is that one sow is a Tamworth, and her progeny, sired by the Large Black boar, are found particularly well suited to the baconer requirements. It will be remembered that the Tamworth strain of the first season was a marked failure.

"This year my farrowing dates are good," it was pointed out, "but with cropping it doesn't become so much of an upset if the farrowings are deranged. I used to be forced into selling stores in autumn, but now the few store pigs I sell go as buttermilk pigs, which are a fairly good proposition at the right time. The 31 pigs carried through the winter will all go away as baconers. Had it not been for crops, I would have had to sell these late litters as small stores or buttermilk pigs on an unfavourable market.

"That is my experience with pigs, worked out over six years, and you can see what it means to me to grow that 1¼ acres of crop and to buy skim-milk at £1 per cow. I would also put in a good word for pig clubs, which are organised by the District Pig Councils, and strongly advise taking advantage of the opportunity to get really good breeding stock at cheap prices."

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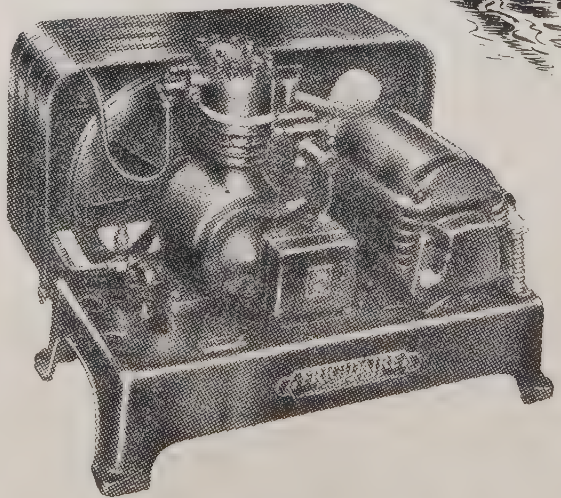

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FARMING A SMALL HOLDING

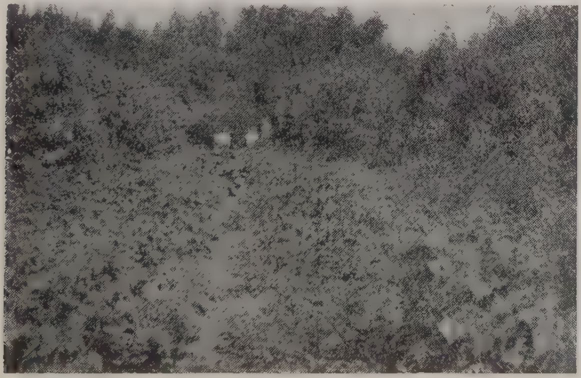
In Hawke's Bay

By

G. A. BLAKE,
Instructor in Agriculture, Hastings.

THE demand for the ownership of a piece of land, both by returned servicemen and civilians, almost exceeds the supply. In many cases finance is the controlling factor, and for this reason alone many are considering the possibility of making a living from a small holding. That it can be done is borne out by the success achieved by Mr. A. E. King, Hastings, whose activities on his farmlet of 5¼ acres are providing a good living for himself and family.

THE area farmed by Mr. King was taken over 14 years ago when it was a bare section with the boundary fences as the only improvement. It is situated two miles from the borough of Hastings, the soil being a fertile sandy loam with a free subsoil, admirably suited to both fruit and poultry.



Cape gooseberries between rows of peach trees.

The farmlet was first run by Mr. King as a small dairy farm to augment his earnings at his trade, but it was later realised that the area was too small ever to become self-supporting under this type of farming. A gradual change-over from dairying to cropping was instituted, until today the whole area is under intensive agriculture and providing full-time employment for Mr. King and his wife.

The Orchard Area

The orchard area consists of 100 young Golden Queen peach trees, purchased at 3/- each, and just coming into bearing. This year 100 half-bushel cases have been sold at 10/- per case, but this yield should increase considerably as the trees mature.

Between the rows of peach trees cape gooseberries and pumpkins were grown, while odd corners and headlands were utilised for early marrows and sweet corn. The cape gooseberries realised up to 1/6 per lb. and showed a gross return of £25, while the pumpkins, not yet harvested, usually realise about £30.

All cultivation has been carried out with one horse, a single-furrow plough, and a spring-tooth cultivator, the spraying being done with a hand sprayer.

Small Fruits

Slightly more than one acre is devoted to raspberries. Here again, all work is performed by Mr. King and his wife, except at harvesting time, when contract pickers are employed.

The area was laid down to raspberries by the purchase of 3,500 canes, which were planted 2ft. apart in rows 6ft. apart. The purchase price of the canes varied from £1 to £1 10s. per 100.

From the middle of December, 15 contract pickers were employed at a rate of 3d. per lb. of fruit picked, while others were employed to carry the fruit from the field to the packing shed, where it was weighed out into 6lb. canisters by Mrs. King. The fruit was picked into shallow enamel pie-dishes to avoid crushing and was conveyed to the packing shed in these dishes; hence the need for these other employees. The firm through which the raspberries were sold provided the canisters free of cost, the only containers provided by the growers being those needed for sales direct to visiting townspeople.

Pumpkins growing between young peach trees. Note the shelter trees.

Half of the area was picked each day, and picking continued for about six weeks, during which time some 8,000lb. of fruit were harvested. The price obtained varied, being 1/9 per lb. in December, but later dropping to the ceiling price of 1/7½ per lb. More than £100 was paid out in wages, while the gross takings amounted to £450.

At a later date it is intended to increase the area by ½ acre, while an immediate start is being made to establish a small area of black currants.

Asparagus

One and a half acres are devoted to asparagus, the whole of the crop being packed for the city markets. The owners themselves handled all the harvesting and packing, and despatched 50lb. to 60lb. per day for 10 weeks. Cutting commenced in the last week in September, when prices ranging up to 3/6 per lb. were obtained, later dropping to 1/- per lb. The gross returns from this area were £245, from which must be deducted costs for cartage, freight, containers and commission. For this area, some 10,000 asparagus roots were needed, these being obtained at 15/- per 100. A considerable saving in establishment costs could have been effected by sowing seed in a nursery in September and transplanting to the permanent area in the following July.

The home-made food cart and chaffcutter for greenfeed.

Poultry and Ducks

Both ducks and fowls were kept in large numbers. The fowls were run on the semi-intensive system, while the ducks had the run of an area of pasture used for grazing the horse and the house cow.

Thirty mature ducks were kept, and from these about 600 eggs were selected for hatching, both by broody hens and a kerosene incubator. Approximately 50 per cent. of the eggs were hatched, and in past seasons it has been the practice to fatten 300 ducklings for table use, the price obtained ranging from 10/- to 15/- each. However, this year 150 ducklings have been sold at 6/- each, so it has been decided to retain the balance for egg production.

Three hundred two-year-old hens were kept only during their best laying months. Of this number, 100 were bought from other poultry keepers with high-producing flocks, and from these eggs for hatching were selected. More than 300 pullets were raised for egg production at an estimated cost of 5/- per bird from hatching to laying at 5½ to 6 months old. Eggs returned £300, but feeding costs amounted to £156, the net result being £1 per week for each 100 birds kept.

Silver beet was grown for greenfeed, but to this was sometimes added succulent weeds from the cultivation area, the whole being chaffed with a hand chaffcutter. The morning mash consisted of 2 parts bran, 1 part wheatmeal, plus 10 per cent. meatmeal. Mixing was done in an electrically-driven poultry food mixer, installed at a cost of £54 10s. Without this machine too much time would have been absorbed in hand mixing, and other activities would have suffered. The night feed consisted of 2oz. of wheat per bird, fed among the litter in the houses to encourage scratching for exercise.

Heavy carrying between the poultry houses and the feed room was eliminated by the construction of a home-made cart large enough to transport all the feed for one meal, thus obviating several trips with their con-

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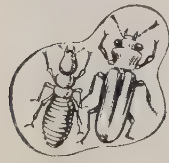


sequent loss of time. Artesian water is laid on for drinking and swimming. To house the flock adequately a new poultry house 100ft. x 23ft. has recently been erected at a cost of £325.

A valuable by-product from the poultry is the large amount of manure produced. This was used on the cultivation area, and to date no artificial fertilisers have been purchased.

The farmlet is well sheltered with *Lawsoniana* hedges and eucalypts, the toppings of which provide both posts and firewood. In the house section walnut trees and chinese gooseberries, both cash producers, are grown for shelter and ornamental purposes, while flowers from the garden also add their quota to the farm revenue. Even the hobbies were made to pay their way, and the breeding of budgerigars, finches, and canaries provided both pleasure and profit.

General Observations

Mr. King readily admits that he has had to learn by experience, and in the past a considerable amount of time and money was spent on ventures which, although profitable, did not return sufficient to warrant their permanent inclusion among his various activities. Again, some of them required attention simultaneously, and would have necessitated the employment of labour.

It will be seen from a study of the operations on this farmlet that only high-revenue producing crops are grown, and that they follow one another in their demands for attention. Commencing with asparagus cutting in September, raspberry harvesting in December, and peach picking in March, the work is spread over a considerable period, resulting in a steady income. During the late autumn and winter the poultry are the main source of revenue, and this period of the year is utilised for cultivation, spraying, pruning and odd jobs.

The Balance Sheet

With no definite plan in mind at the commencement except to provide a living from the farm, it has taken 14 years to attain the objective of £10 per week net profit. What has taken Mr. King this time to achieve can be reached in a much shorter period by profiting from his experience and concentrating on those lines where the demand usually exceeds the supply.

The following gross returns were received during last year:—

	£
Asparagus	245
Raspberries	450
Peaches	50
Cape gooseberries	25
Pumpkins	30
Ducks	45
Poultry	300
	£1,145

To produce this return the working expenses were approximately as follows:—

	£
Wages	100
Feeding stuffs	156
Repairs and maintenance	25
Freight, cartage, commission	235
Rates	4
Depreciation	45
Insurance	6
Seeds, sprays, containers	20
Straw for poultry houses	33
	£624

This leaves a sum of £521, which has to provide for interest and living expenses only, the latter being low as a considerable portion of the living is produced on the farm, while house rent, a costly item to most people, is free.

It is thus realised that a small area under intensive farming can provide an enviable living, but much depends on the man and his wife, and both must be prepared to work hard.

Although this 5¼-acre farmlet gives Mr. King and his family an assured income, the spectre of a crop failure is always present, and he considers that a slightly larger area, say eight or nine acres, would remove this constant fear.

Measuring Areas of Land

484 square yards
10,000 square links } 1 square chain

10 square chains
4,840 square yards
100,000 square links } 1 acre
4 roods
160 perches

640 acres 1 square mile.

MEASURE OF LENGTH.

7.92 inches = 1 link.

5½ yards
25 links } = 1 pole or rod

100 links
22 yards } = 1 chain
4 poles

8 furlongs
80 chains } = 1 mile
1,760 yards

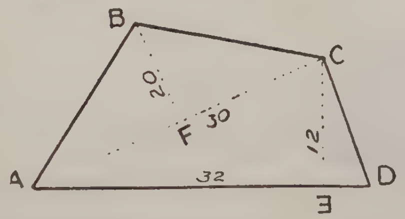
A paddock 40 chains square would be

40 × 40 = 1,600 square chains.

1,600 ÷ 10 = 160 acres.

A paddock 70 chains long by 40 wide would be

70 × 40 = 2,800 square chains.
2,800 ÷ 10 = 280 acres.



Rule.—Multiply length in chains by width in chains, and divide by 10 for acres. This applies only where all the fences are at right angles.

When paddocks are of irregular shape, they must be divided into triangles, the contents of each triangle ascertained, and their acreage added together.

A line must be drawn across from corner to corner, dividing it into two triangles.

(The numbers in the figure are chains)

Area of A B C D = area of A B C + A C D.

On the line A C draw the perpendicular line B F.

Area of A B C $= \frac{BF \times AC}{2} = \frac{20 \times 30}{2} = 300.$

On the line A D draw the perpendicular C E.

Area of A C D $= \frac{CE \times AD}{2} = \frac{12 \times 32}{2} = 192.$

Total area = 300 + 192 = 492 square chains.

Divide by 10 to bring to acres.

= 49 acres 2 square chains or 49⅕ acres.

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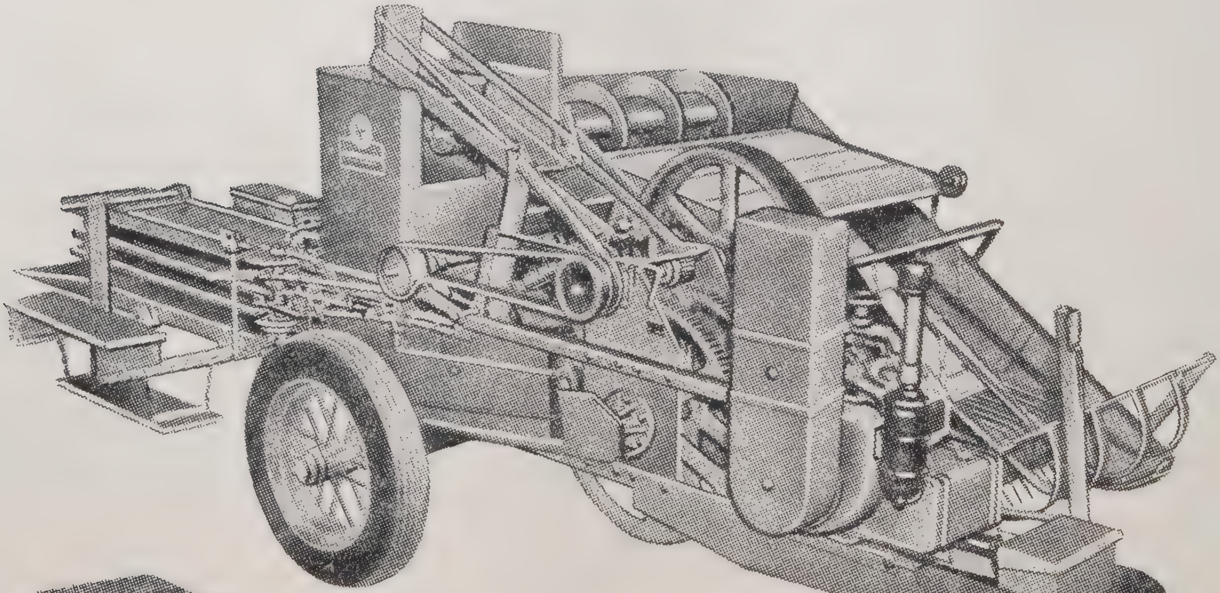

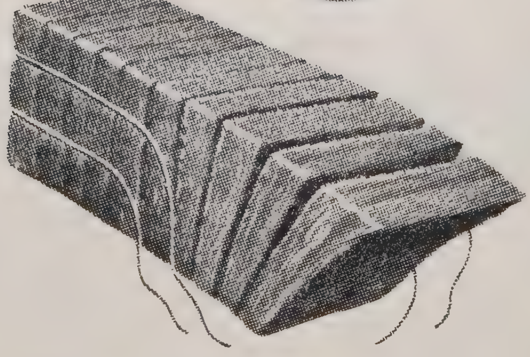

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Pig Management

Litter Production

(Continued.)

QUITE recently prominence was given to the exceptional performance of a 16-year-old Romney ewe having in her lifetime reared a total of 27 lambs. The owner would no doubt have considered himself fortunate indeed if the gross return of the ewe reached £50. A sow rearing a litter of 10 pigs, if given the right attention and care, would more than equal this great productive effort in six months, and would continue the good work over a period of years.

By

H. M. PEIRSON,

Superintendent of the Pig Industry, Wellington.

STRANGELY enough, while pride of ownership is exhibited in every class of livestock, the pig in many cases seems to be the exception to the rule. This may be because we have become accustomed to treating them as scavengers, and this scavenger complex has been allowed to cloud our appreciation of their reproductive qualities, or because they have lived under indifferent conditions so long and shown a profit that our appreciation of the very real value of pigs as converters of waste products has been obscured. This particularly applies to the conversion of dairy by-products into a marketable product.

Nutrition

Many of the disasters which take place both before and after farrowing can be traced to the improper feeding of the sow. It is imperative at this time that special attention should be paid to the condition of the sow's bowels. When necessary reduce the feed just before the litter is due as a precaution against milk-fever or swollen udders (this applies particularly to maiden sows). If possible, do not let the sow have any feed immediately before farrowing; as long as she is not hungry she will be better without food. Plenty of water, however, is of vital importance, as the sow may be in a fevered condition. Much harm can be done to both the sow and the litter by over-feeding at this critical stage, and all that will be required for the first day is a bran mash or a little molasses and meal.

The sow should not receive full rations until the pigs are about a week old, and even then the appearance of the sow's udder, the size of the litter, and the general condition of the whole family should be the guide. As the pigs grow the sow should be given all the food she will clean up, for with a big litter to feed the strain on her is heavy, and she must be able to make plenty of milk.

A sudden change in food should be avoided, as it is likely to upset the pigs, even though a sow can take it and show no reaction herself. The important point to remember is that the size, condition, and vitality of the piglets depend on the feeding of the sow properly, and mistakes made here are hard to catch up on. Careful observation is worth more than any hard-and-fast feeding regulations. For instance, big sows will require more feed than small sows. This applies also to litters, and it is only when sows are fed according to what they have to do that it is possible to produce fast-growing pigs that are likely to reach a weight of 40lb. at 8 weeks.

It is only when the sow is well fed that it is possible to judge her milking qualities, and the yardstick by which this is measured is the total weight of the litter when it is 3 weeks old, and this should be at least six times the birth-weight, or 12 to 15lb. per piglet. It is difficult to obtain this unless they have had the advantages of a good feed supply in the first three weeks, when they are entirely dependent upon the sow.

Amounts of Feed

It is estimated that while suckling a litter an average-sized sow needs 6lb. feed (6lb. grain, 6 gallons skim-milk, or 10 gallons whey), and 1lb. feed, or its equivalent, daily for each pig in the litter. While this will serve as a useful guide, successful feeding depends on the intelligent observation and experience of the owner, and it is his obligation to see that they get enough, which will be as much as can be cleaned up in about 20 minutes. In the first three weeks the sow will probably take all the feed; thereafter, or when the piglets commence to feed from a "creep," her ration can be reduced accordingly. If the sow is getting thin, she wants more feed; if fat, less. Where sows are turned out on to good grass they may often get all their maintenance as pasture, and this, along with 4 or 5lb. feed, or 4 or 5 gallons of milk, will suffice as weaning time approaches.

Rearing the Litter

Attention given to the litter from birth to weaning gives more satisfaction to the owner than at any other stage of the pigs' lives. Just as the abundance of the harvest is paramount in the profits of the farm, so is the excellence of the litter the foundation of profitable pigs. All animals at birth have a decided inclination to grow rapidly—the so-called "growth force"—and if this is destroyed by keeping them under conditions unsuitable to growth, the animal loses its ability to resist infection or to throw off from its system poisonous by-products associated with digestion. These infections are pronounced in the weakly pigs, and are usually blamed for their poor health and growth, whereas they are of a secondary nature, being brought about by poor management. Disease is present everywhere, but is not so likely to affect the thrifty, vigorous animals, simply because they have a higher power of resistance.

Setbacks to the Litter

Up to three weeks most litters experience very little trouble, unless it is from scours. This is usually caused by some infection picked up in the sty, and is most difficult to combat, because it often goes unnoticed in its early stages. Treatment of the sow is the most satisfactory way. A dose of salts to check the milk flow for 24 hours, which gives the litter a mild starve, is quite useful. Many owners have great faith in different kinds of mineral mixtures, especially those containing iron, since anaemia of the young pig is often blamed for babyhood upsets. Cases of this kind, if caught in the early stages, can quite often be controlled by dosing with Parrishes' chemical food. One-quarter of a teaspoonful per pig daily, administered with a spoon, or, better still, with an eye-dropper, has proved quite satisfactory.

It is most noticeable when a litter is let out of the sty for the first time how eagerly the pigs eat ordinary soil. Investigators the world over have offered explanations of this soil-eating habit, with the result that the Department of Agriculture recommends the already widely-adopted practice of putting a sod of fresh earth into the sty for the little pigs. Soil possesses valuable absorbing properties for some of the by-products of digestion. It contains suitable low concentrations of essential elements such as lime, phosphorus, potash, soda, magnesium, iron, chlorine, and sulphur, all of which are essential to health. Fresh soil also satisfies the pig's desire for exploring the floor of his sty, and so reduces the possibility of picking up infection, which may get into the sty through other channels. It is most noticeable, too, that pigs bred under open-air conditions, where they have access to clean pastures, are healthier and show more resistance to these early troubles.

Castration

Castration of males in the litter is best performed while the pigs are still on the sow. Castration is a surgical operation, which in England is usually performed by a veterinarian. In New Zealand, however, the farmer castrates his own pigs, and in many cases the after-effects result in secondary troubles, which are responsible for condemnation and rejection of carcasses at the works. This represents a big loss to the industry, not only in meat production but in cash returns to the farmer, since, if there is any reason to suspect that the cause of condemnation of any part of the carcass is the result of faulty castration, no compensation is paid. The operation should be performed any time between three and five weeks, and the tools used and the conditions should be scrupulously clean. When the incision is made into clean, healthy tissue, healing should be rapid and uneventful (see bulletin No. 230, "Castration of Pigs"), otherwise it might give rise to secondary complaints, which may prove vexing and costly. Quite often the application of strong antiseptics to the wound is the cause of the trouble. After the operation apply Stockholm tar, which is both cheap and non-irritant.

The Creep

It is generally agreed that for the first three weeks the piglets get almost all their nourishment from their mother's milk, and for this reason the

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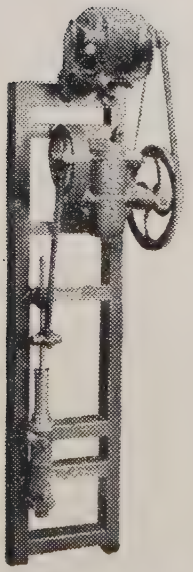

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weight of the litter at three weeks has been used as a measure of the sow's ability. To relieve the strain upon the sow it is most important that the litter should be encouraged to commence feeding. This should be done as soon as the pigs are noticed obtaining feed from the sow's trough, or when they reach the age of three weeks. It is now time to start feeding them separately, and a "creep" should be erected where the pigs can obtain feed without interference from the sow. A little new milk, skim-milk, and molasses will often tempt them to start. This will not only make them independent of the sow, but will relieve her of the strain of having to provide all the feed-supply. It also gives occupation to the youngsters, which, in turn, brings contentment. The table below provides a guide as to their average requirements at various ages.

HOW MUCH FEED DO THEY NEED?

Age of Pig. (In Weeks.)	Milk or Whey. (Gallons.)	Concentrates. (Ounces.)
3	½ — ½	2
5	1 — 1½	4
7	1½ — 2½	6
8	2 — 3	8

The growth pigs make at this stage of their lives is less costly and gives more satisfaction than at any other time.

The quantity of feed required by the litter depends not only on the number of pigs, but on the individual weight of the pigs. The feeder must use his judgment and appreciate that the feed required by the litter increases daily. The tables have been made up from trials conducted over a number of years by Pig Recording Clubs, representing some 1,500 litters, and should serve as a useful guide. The policy to follow is to give them all they will eat in a dry feeder, and all they will drink in a trough. The main point, however, is to see that the feed is at all times clean and wholesome. Every effort should be made to avoid insanitary conditions, which encourage scours, which in turn not only retard growth and reduce vitality, but make the pigs susceptible to all kinds of troubles. The "creep" also assists the less vigorous members of the family, who may be less vigorous only because they are on a weak teat. Again, the sow, not having to provide the whole of the nourishment for the rapidly-developing litter, is able to maintain her condition and vitality, thus being ready for service when the pigs have been weaned at eight weeks.

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Weaning

It may seem unnecessary to mention that there is a right and a wrong way of weaning pigs; nevertheless, many of the disappointments experienced after weaning are attributable to lack of understanding on the part of the owner. In the first place the sow should be taken away from the litter, not the litter from the sow. Pigs are creatures of habit, and to be suddenly taken from familiar surroundings and at the same time from the protection of the sow is sufficient to bring about that setback which everyone should try to avoid. The removal of the sow and the leaving of the piglets in familiar surroundings for a few days to enable them to become used to sleeping by themselves is the first step towards success, and is an important part of weaning. When several litters are weaned at the same time not more than 10 pigs should be run together, and then only when they have been graded into size. Too many not only cause crowding at the trough, but also in the sleeping-quarters, resulting in fighting, with the big fellow gaining all the advantages at the expense of the little one, who makes small progress.

The production of good litters is the starting-point of successful pig-keeping. When sows are ill used even the best of care given to other pigs is sadly misplaced. A good boar, good sows, good feeding, and good conditions are, of course, necessary, but are not everything. By far the **most important attribute** is the interest of the man doing the job. The human element plays such an important part in pig-keeping that success can be achieved where conditions are far from ideal. Good stock and good conditions will, however, encourage the man doing the job, and will create enthusiasm and that pride of ownership so evident in the management of other domestic animals.

◆

Pig Industry Broadcasts

UNDER the auspices of District Pig Councils broadcasts will be delivered in May as follows:—

Auckland.—1YA, on May 16, at 7.15 p.m., "Care of the Young Pigs after Weaning," by F. Barwell, Supervisor, Bay of Plenty District Pig Council.

Wellington.—2YA, on May 15, at 7.15 p.m., "Imported Grain-feeds," by C. H. M. Sorensen, Supervisor, Taranaki District Pig Council.

Christchurch.—3YA, on May 17, at 7.15 p.m., "Answers to Questions," by H. McIntosh, Supervisor, Canterbury District Pig Council.

Napier.—2YH, on May 10, at 7.15 p.m., "The Use of Concrete in Piggeries," by I. H. Owtram, Supervisor, Tairawhiti District Pig Council.

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FARMING IN NEW ZEALAND

North Island Soils

SUCCESSFUL farming depends both on the natural fertility of the soil and the management methods adopted to improve fertility. This article describes the main kinds of soil in the North Island and the conditions which have influenced their formation; it will be followed by an article on soils of the South Island. These articles give the necessary background to the notes on the soils of particular localities which appear in the series on "Studies in Farm Management."

By

L. I. GRANGE,
Soil Survey Division,
Dept. of Scientific and
Industrial Research,
Wellington.

THE land under occupation in New Zealand is put to many uses: mainly to the growing of grasses and clovers for grazing dairy cows and sheep; less extensively to the production of grain and seeds, tobacco, and linen flax, fruit, vegetables, and timber, and to the growing of miscellaneous supplementary forage and fodder crops. All crops demand suitable climatic and soil conditions in order to return yields of economic value to the grower: wheat gives the highest yields and is of the best quality in the drier districts, but needs adequate rainfall in the spring; orcharding districts should be free from frost when the fruit is set. For satisfactory growth crops also demand from the soil certain levels of fertility; for instance, clovers do best where there is a good supply of lime in the soil, whereas linen flax produces the best fibre on soil with moderate lime content. Again, market garden leaf crops thrive where the soil contains plenty of nitrogen, but root crops fare well with lower amounts and demand more potash.

Because of the different soil conditions required by each crop, and because there is a variety of soils in New Zealand, it is useful to know their properties and their geographical distribution.

SOIL-FORMING FACTORS.

Soils are formed from rocks, the upper layers of which, being exposed to the influence of rain, wind and variations of temperature, break down to form a layer of rock waste. In the rock waste micro-organisms—bacteria, fungi, etc.—and vegetation such as grasses, shrubs, and trees gradually establish themselves. The decay of plants builds humus into the top few inches, and forms what may be called then a soil. The kind of soil formed will depend on the nature of the rocks from which it comes, and subsequent changes in it will depend on the climate, the vegetation, and the slope.

Influence of Parent Material

If the rock contains a low percentage of the minerals necessary to support life, the resulting soil will tend to be infertile, but if the rock is rich in these elements, the soil will tend to be fertile. For instance, granite rocks such as are found in the back country of Nelson give rise to soils of low fertility, whereas basalt, occurring at Auckland City, breaks down to form fertile soils. The colour is largely determined by the parent rock. Rocks high in iron, e.g., basalt, give rise to reddish-brown or brown soils, while those derived from rocks low in iron, e.g., papa, tend to be yellowish or grey.

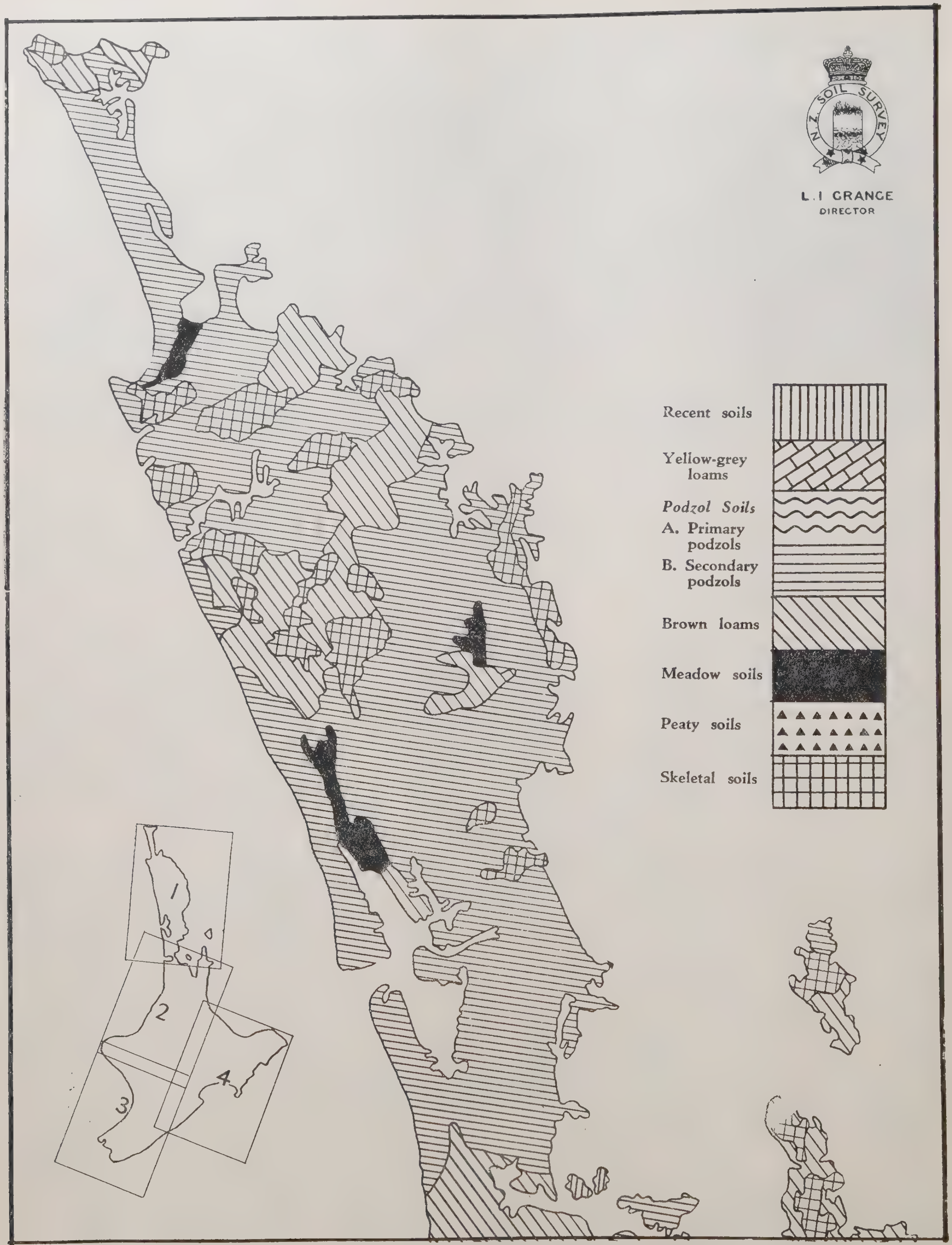
Climate

Rainfall is the dominating climatic influence on soils. Rain soaking down through the soil carries with it soluble compounds. In this way foods necessary for the growth of plants are gradually lost by being carried away in the drainage water. The higher the rainfall, the poorer the soils become.

Regardless of the composition of the parent rock, soils developed under heavy rainfall tend to be less fertile than those developed under moderate or low rainfalls. Where rainfall is very low, as in parts of Central Otago, with a fall of 15in. a year, the plant foods are not washed out of the soil, or, if at all, extremely slowly. In this case the fertility is high, except that moisture is too low for the growth of good forage plants.

Vegetation

The type of vegetation is largely controlled by the climate and soil: for example, where the rainfall is slight (as in Central Otago and Canterbury) grasses and shrubs are the natural vegetation, whereas in Westland and over most of the North Island, where the rainfall is heavier, forest was once dominant. The part played by vegetation in controlling the development of the soil is not, however, generally recognised. Rainwater percolating downward leaches the soil of soluble minerals, and thus the soil tends to become poorer and poorer. The plant, however, reverses the process, and tends to maintain soil fertility. As the minerals are washed down through the soil by percolating waters the roots of the plants absorb those necessary to maintain life, and these are built into plant cells. In the process of time leaves and twigs fall to the ground, where they decompose, form-



N.Z. SOIL SURVEY
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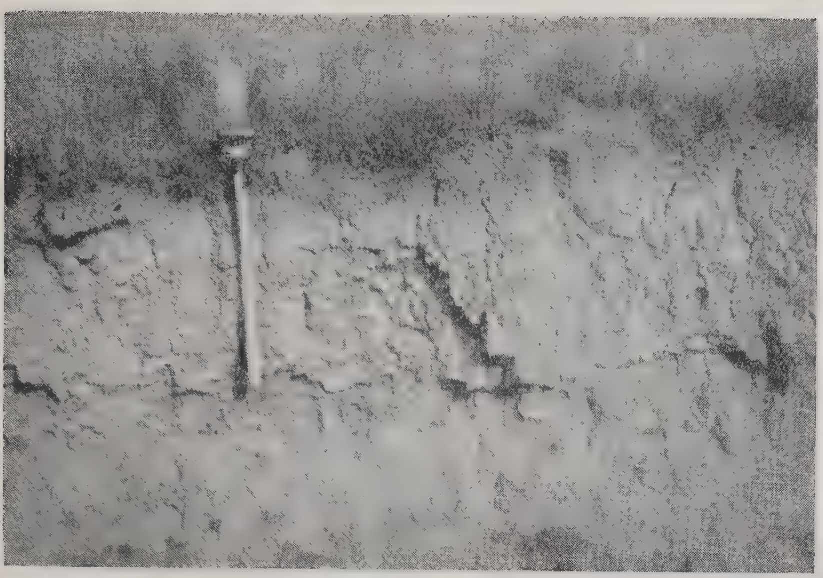
Recent soils
Yellow-grey loams
Podzol Soils
A. Primary podzols
B. Secondary podzols
Brown loams
Meadow soils
Peaty soils
Skeletal soils
1
2
3
4

Soil Map of North Island, Section 1.



Yellow-grey loam, Wairarapa.

ing a layer of humus, in which bacteria and other soil life flourish. As the humus decomposes the mineral substances are set free, to be once more gathered up by the roots of the plant.

This cycle is an important one in soil formation. If a plant takes much from the soil, it returns much to the soil, and consequently the soil is kept in a high state of fertility. If, on the other hand, the plant takes little from the soil, it also returns little, and consequently the soil is poor.

One of the best examples of a native tree that maintains soil fertility is the puriri tree. It extracts from the soil large quantities of lime, potash, and phosphate; hence, when its leaves, rich in these substances, fall to the ground they decompose quickly to form a rich, mellow humus, setting free the minerals, which are once more absorbed by the roots of the tree. The farmer recognises this effect when he speaks of puriri land as being good land.

The forest floor beneath the trees that maintain fertility at a comparatively high level consists of a thin layer of dried leaves resting on a mellow topsoil, with which is incorporated the mild humus from decomposing leaves. All trees, however, are not as efficient as the puriri in returning minerals to the surface. The taraire and tawa are moderately efficient, but the totara, rimu, beech, and kauri are much less so. The kauri, for instance, demands little from the soil in which it grows; hence its leaves, twigs, and bark, when they fall to the ground, contain little or no lime or other foods. The resultant humus is acid and decomposes slowly, for many bacteria do not find it a suitable medium in which to multiply, and much of the work of decomposition is left to moulds and other fungi. Owing to the slow rate of decomposition, the ground beneath a kauri tree gradually becomes covered with a thick layer of acid humus resembling peat, in which are retained many of the minerals previously drawn from the soil by the roots of the tree.

Under these conditions the soil gradually becomes poorer, for not only is the return of minerals very slow, but acid waters draining from the peaty humus help further to leach the soil of the lime that remains. The soil ultimately becomes extremely acid, and even the iron alumina and clay move downward into the subsoil, forming subsoil pans.

Slope of Land

The slope of the land also affects soil development. On steep hillsides the soil moves slowly down the slope as it is formed, and new soil from the underlying rock takes its place. With the rock breaking down, giving a fresh supply of plant food, the soils retain a higher fertility than those on neighbouring flat or easy land under the same conditions of climate and vegetation.

SOIL GROUPS.

All the factors mentioned above give rise to a number of different kinds of soils. Only under one condition would a uniform soil be possible over the surface of the North Island, namely, if there were only one kind of rock and a uniform climate, vegetation, and slope. All farmers have some knowledge of the variation to be found in all these factors. The soil man has recognised seven groups of soil, based mainly on the kind of rock from which they are formed. These are:—

1. Recent soils;
2. Yellow-grey loams;
3. Podzol soils;
4. Brown loams;
5. Meadow soils;
6. Peaty soils;
7. Skeletal soils.

The distribution of each is shown on the accompanying maps, and a description of them is given further on in this article.

Most of the groups are divided into stages, these depending on the extent to which plant foods and other elements have been washed down (leached) from the soil by downward-percolating rainwater. The soil man recognises the extent to which leaching has occurred by examining a vertical section of soil and subsoil, such as is exposed in road cuttings, and noting such features as the colour,

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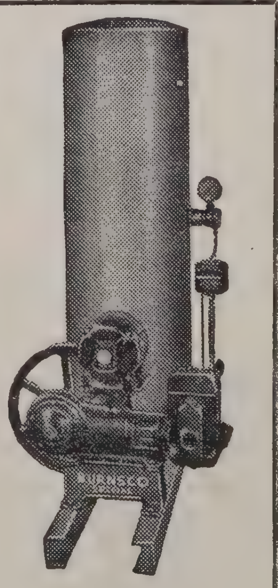

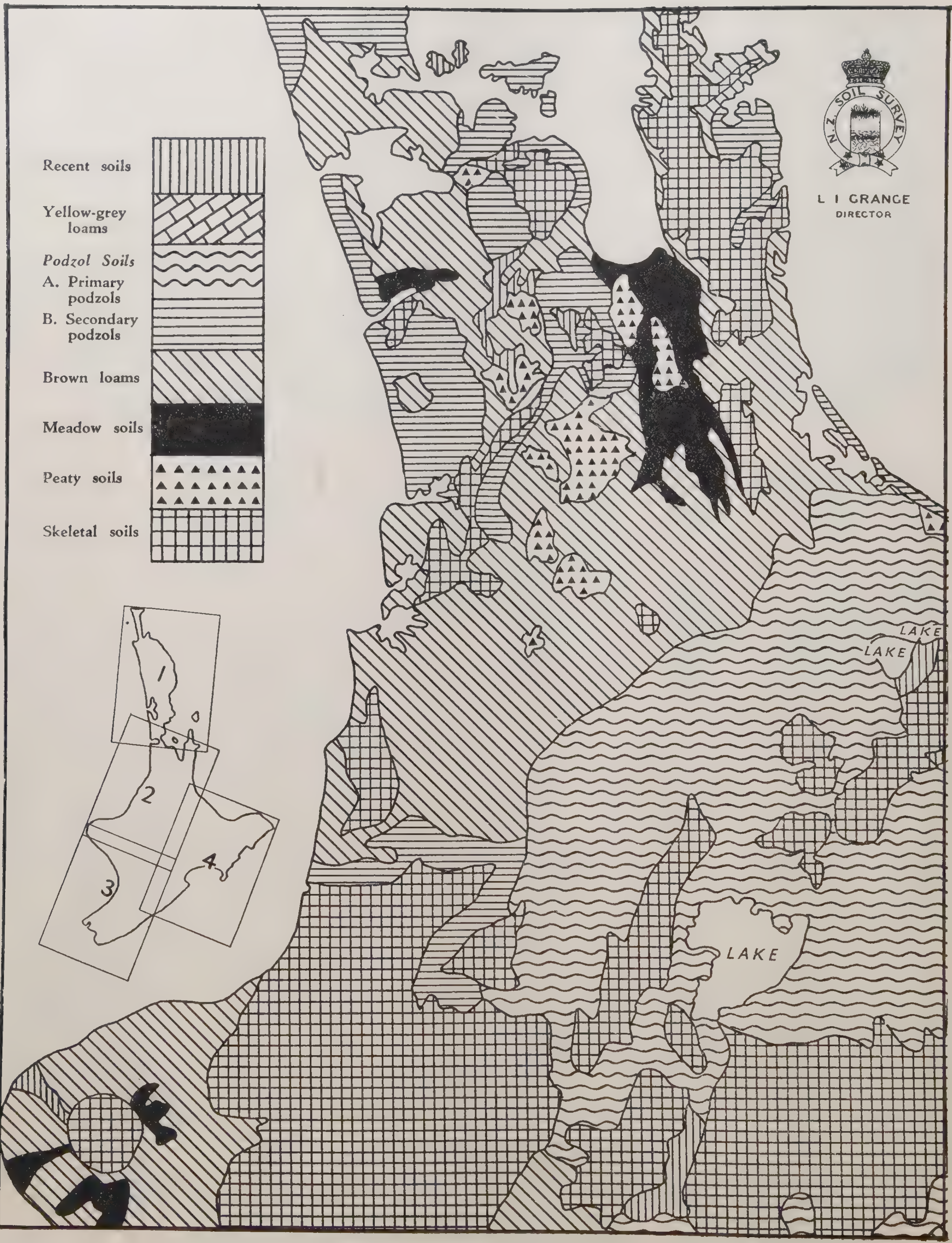
Recent soils
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A. Primary podzols
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Brown loams
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Peaty soils
Skeletal soils
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LAKE
LAKE
1
2
3
4

Soil Map of North Island, Section 2.

texture, structure, and compaction of the layers. The progressive stages are termed young, immature, semi-mature, and mature, and examples are given in the description of the podzol group.

1. *Recent Soils*

Recent soils are those that have been formed in historic times. They are derived from river alluvium, which is still being added to from time to time by present-day floods or from recent volcanic eruptions. The recent soils from alluvium floor the main valleys; they are for the most part very fertile loams and clay loams, and are extensively developed on the Heretaunga Plains and the Manawatu, Gisborne, Wairarapa, Woodville, Rangataiki, and Opotiki districts. Less fertile and gravelly sandy soils, in some places poorly drained, are widely scattered throughout the island.

The recent soils from volcanic ash are of three main types: (a) the fertile grey sandy loam of the Rotomahana mud (erupted in 1886) to the east of Rotorua; (b) the droughty gravelly sand formed from ash erupted from Tarawera Mountain in 1886 and lying to the east and north of the mountain, and (c) the sandy loam ash that covers the roughly circular area of about 30 miles radius around Ngauruhoe volcano.

2. *Yellow-grey Loams*

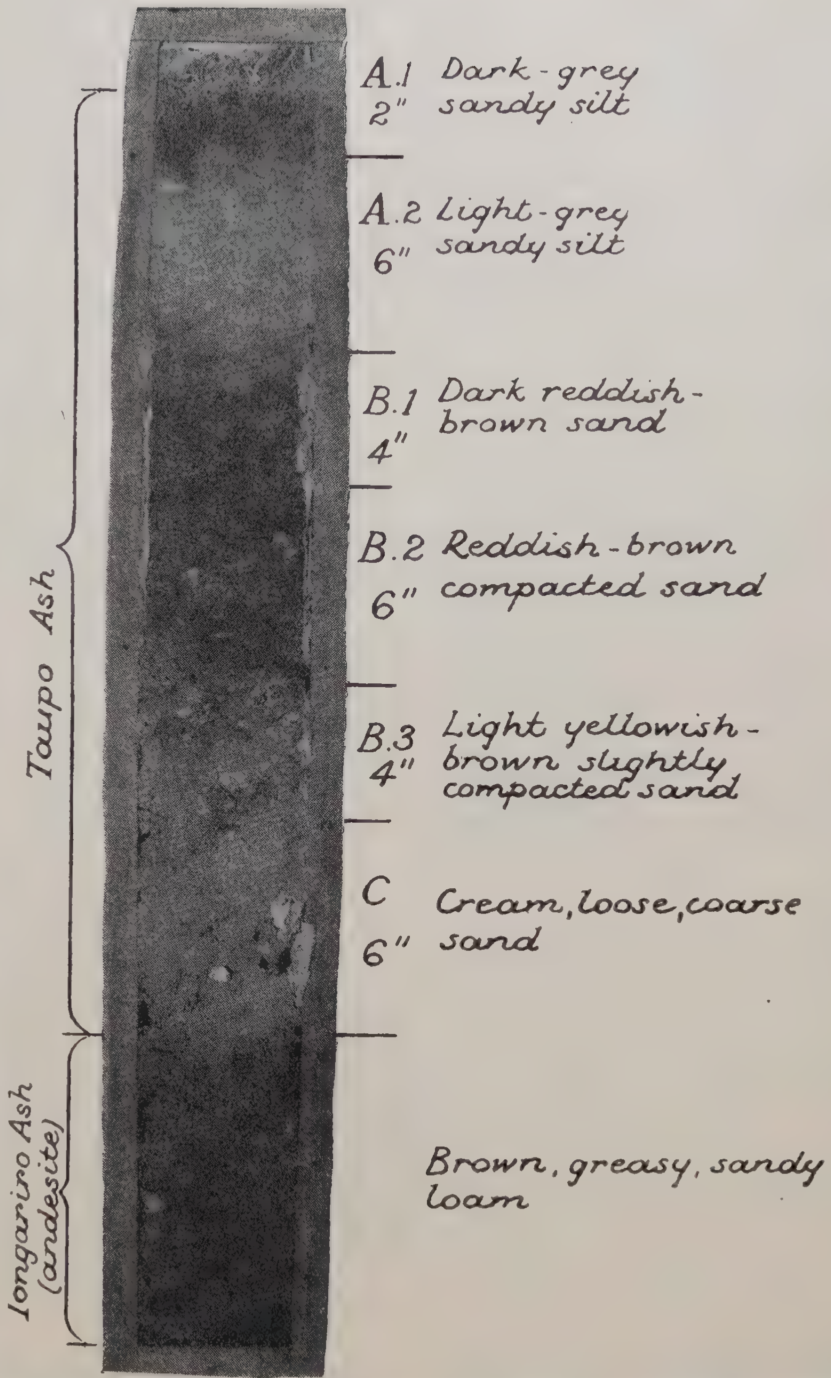
The yellow-grey loams are developed mainly in Hawke's Bay, Wairarapa, and Manawatu districts, where the yearly rainfall is 30-45in. Most of them are derived from mudstone and sandstone comparatively rich in lime. Under these conditions leaching is never excessive, and in consequence the soils are fairly fertile, being but slightly acid and containing a good supply of plant nutrients. Phosphate is the chief soil deficiency, superphosphate being extensively used as a top-dressing for pasture lands. The soils of this group in the Manawatu originally contained less lime than in the other districts, and consequently lime responses are good.

The topsoils are grey, and work down to a good tilth if cultivated when the moisture content is correct. The subsoils are yellow-grey in colour and heavier than the topsoil. In places the subsoil is cemented to form a pan. Mole drains are used with success on the flattish areas.

These soils are used mainly for sheep-farming, particularly for the production of fat lambs. In the Manawatu dairying is important.

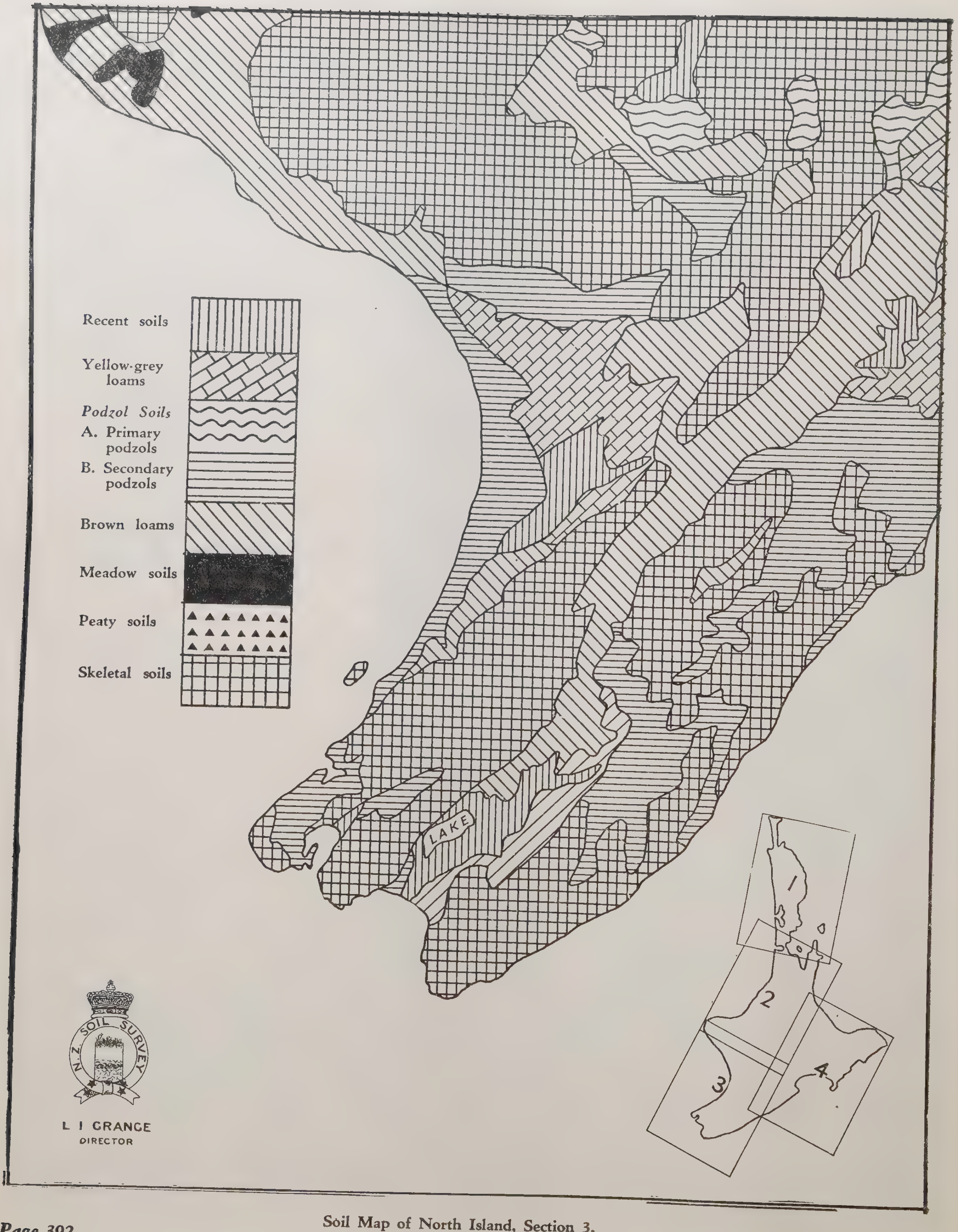
3. *Podzol Soils*

The name podzol is a Russian word of peasant origin referring to the ashy grey colour of the subsoil. Podzols form in wet climates, and when the soil is well leached develop a grey-coloured layer at roughly 6in. to 12in. from the surface. This is due to the action of rainwater, which, becoming acid in the topsoil, percolates downward, dissolving iron and other compounds from the upper part of the subsoil and bleaching it to a grey colour. Most of the iron that is dissolved is deposited further down in the subsoil, this in places forming a pan.


A.1 2" Dark-grey sandy silt
A.2 6" Light-grey sandy silt
B.1 4" Dark reddish-brown sand
B.2 6" Reddish-brown compacted sand
B.3 4" Light yellowish-brown slightly compacted sand
C 6" Cream, loose, coarse sand
Brown, greasy, sandy loam
Taupo Ash
Tongariro Ash (andesite)

Two kinds of podzol are recognised: (a) from pumice deposits; (b) from sedimentary deposits.

(a) Pumice podzols: The pumice soils are formed from coarse rhyolite pumice deposits erupted a few thousand years ago. There are two main deposits—the Taupo pumice and the Kaharoa pumice. Taupo pumice extends from National Park north to near Rotorua, west to Putaruru, and east to Tutira and Tiniroto. The soil is sandy, but holds moisture well. It is not naturally fertile, being low in


Recent soils
Yellow-grey loams
Podzol Soils
A. Primary podzols
B. Secondary podzols
Brown loams
Meadow soils
Peaty soils
Skeletal soils
LAKE
1
2
3
4
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Soil Map of North Island, Section 3.

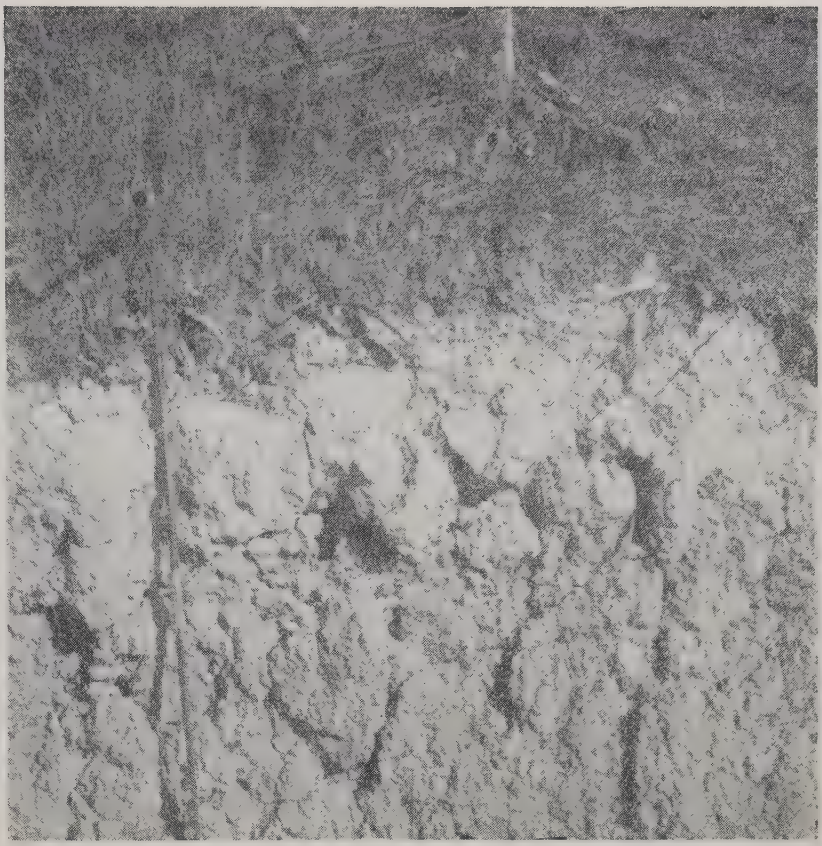
phosphate, but where it has been topdressed heavily with superphosphate it grows grass well and many good dairy farms have been established on it. Kaharoa pumice covers a smaller area than the Taupo pumice, extending from Gate Pa near Tauranga in the north, along the shores of the Bay of Plenty to Whakatane, and south towards Waikaremoana and Rotorua. This pumice is much harder than the Taupo pumice and does not hold moisture so well. The topsoil is a sand and the subsoil generally a gravelly sand. Where the coarse soil occurs in moderate rainfall areas dairying becomes difficult owing to summer dryness. Where, however, the subsoil is somewhat finer, as along the shores of the Bay of Plenty, good pastures can be grown which respond to superphosphate topdressing.

Cattle and sheep grazing on Taupo and Kaharoa pumice have in the past suffered from "bush sickness": now this is remedied by putting a cobalt salt in the superphosphate.

(b) Podzols from sedimentary rocks: Podzols from sedimentary rocks show well the stages in leaching previously mentioned. In the young and immature stages the subsoils are brownish-yellow in colour; the more leached soils in the semi-mature stage show a dull greyish yellow subsoil, and in the mature stage leaching has given to the subsoil a light grey colour.

Young podzol soils are developed on sandhills on the west coast—in the Manawatu and north from Raglan at various localities up to the far north of Auckland. They carry a good pasture, especially in the Manawatu, but are droughty. They respond well to superphosphate.

Young and immature podzols derived from calcareous sandy mudstone are best developed in the King Country and in the Wairarapa. They are fertile. Immature podzols derived from sandstone and greywacke cover fairly large areas in North and South Auckland. They need topdressing with superphosphate and lime.



Immature podzol profile at Pahautanui, near Wellington.

Semi-mature podzols occur in North Auckland. Because of their heavy texture they improve slowly. For pastures there is need for heavy dressings of phosphate and lime. The mature podzols are confined to North Auckland and are popularly known as gumlands. They are strongly acid and well leached of plant foods. Those that are loamy respond well to lime and phosphate, but where the topsoil is a sand and pans are well-developed even heavy topdressing does not improve the fertility, because of the wide fluctuations in soil moisture.

4. The Brown Loams

The brown loams are formed from andesite, basalt, and dolerite rocks, and volcanic ash. An example of an andesite rock is the rock that forms Egmont volcano, and of the andesite ash the fragmental material seen in road cuttings in Western Taranaki. Examples of basalt rock are the boulders gathered from fields to form fences in the vicinity of Auckland City, and of the basalt ash the scoria cones of Auckland City. Dolerites are somewhat similar to basalts. There are three sub-groups of the brown loams: (a) yellow-brown loams; (b) brown granular clays; (c) red-brown loams.

(a) Yellow-brown loams: The yellow-brown loams are derived mainly from andesite ash and greywackes. They occupy most of the easy country north of the pumice podzols previously described to the neighbourhood of Auckland City. Southward the main occurrences are in practically the whole of Western Taranaki and parts of the flats in the Dannevirke-Takapau and Wairarapa districts. The greater part of the dairying in the North Island south of Auckland City is located on the yellow-brown loam. They are all friable soils with a fine granular "fluffy" structure. The soils

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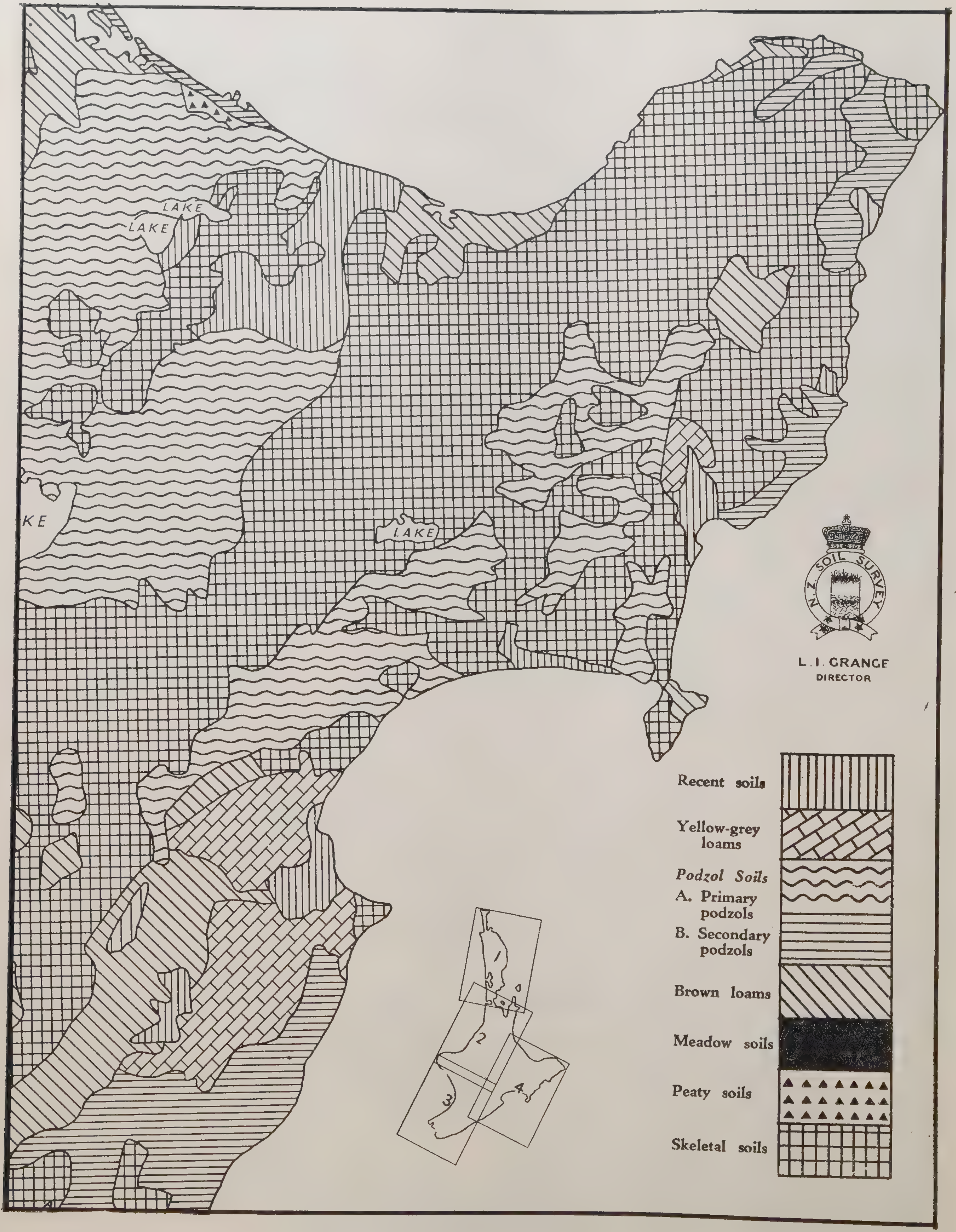
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Recent soils
Yellow-grey loams
Podzol Soils
A. Primary podzols
B. Secondary podzols
Brown loams
Meadow soils
Peaty soils
Skeletal soils
1
2
3
4

Soil Map of North Island, Section 4.

Mature podzol, North Auckland.

contain much iron, as do all the other sub-groups of the brown loams.

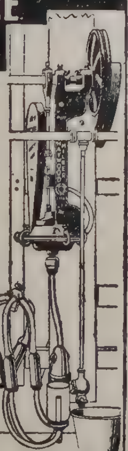
The yellow-brown loams on the easy country from northern King Country north to the Waikato mouth and east to Tirau and Putaruru are free silt loams, slightly acid. They respond to phosphate and to lime. Where the rainfall is heavy—more than 80in.—the soils are markedly leached, compact in the subsoils, and have in places a very thin iron pan. These soils require heavier dressings of phosphate and lime.

The Tauranga-Waihi soils are coarser in texture and show well the progressive stages of leaching. The least leached are the black soils of Tauranga. On the Waihi Plains and on the foothills south of Katikati the soils are more leached and respond to phosphate, potash, and lime dressings. A similar series of soils covers the rolling and moderately steep hills in the eastern Bay of Plenty and northern Gisborne districts.

Darker brown soils derived from andesite ash beds occur on the easy land of Western Taranaki and along a strip extending from Ohakune to Taihape. They are slightly to moderately acid and again show well the stages of leaching under increasing rainfall. The most fertile are those covering the low-rainfall areas of South Taranaki, where the topsoils are black, and the most leached soils and consequently the least fertile occur closer to Mt. Egmont, where the rainfall rises to 100in.

(b) The brown granular clays: Brown granular clays cover large areas of hill land between Dargaville and Kaitaia, in the Waitakere district near Auckland, and in the Coromandel Peninsula. They cover the low hills that rise from the Waikato farmlands in the Hamilton district and much of the rolling land further north. The North Auckland soils of this group have granular free topsoils, and in the more leached types the subsoils are compact and sticky. The soils that are little leached are fertile, whereas in the well-leached stages they are strongly acid and infertile. The soils of this group in the Waikato farm well.

(c) The red-brown loams: The red-brown loams are confined to the Auckland district, where they are derived from basalt volcanic rocks and scoria.



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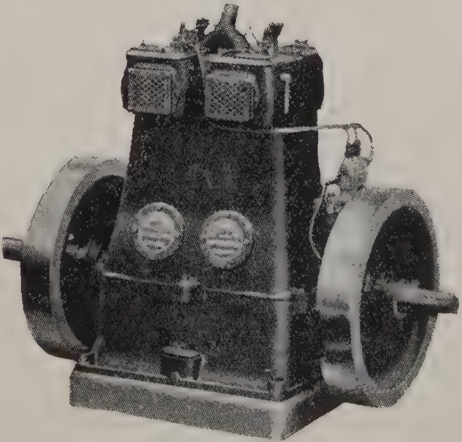

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Upper.—Immature yellow-brown loam near Te Awamutu. Lower.—Brown granular clay near Hamilton.

The young soils are only slightly acid and are well supplied with plant foods, but on some areas they are too shallow and rocky for good farming. The moderately-leached soils are more acid and need heavy dressings of lime and phosphate to support a good pasture. The well-leached soils ("ironstone" soils) occurring in the Bay of Islands district are infertile and are regarded as problem soils, for as yet no permanent pastures have been established on them. It is likely they require very heavy dressings of lime.

5. *Meadow Soils*

The meadow soils have developed on low-lying flats with the water-table at or close to the surface. Many of them are now drained. The subsoils are white or grey and generally heavy. They poach badly in winter. The largest areas are found in the low flats of the Hauraki and Waikato basins, in South Taranaki, and in North Auckland near Ruawai and Awanui. In most places topdressing with lime and phosphate is required.

6. *Peaty Soils*

In wet, low-lying depressions sedges, rushes, and mosses grew and were prevented from decaying by the lack of air. In the centre of some depressions undecayed plant remains extend to a depth of 30ft. or more. The material is called peat, and the soils derived from them peaty soils. On the margin of the depressions the peat contains some ordinary mineral soil that has been carried in by streams draining into them.

Peaty soils are best developed in the Waikato and Hawke's Bay lowlands, the Bay of Plenty, and parts of North Auckland. There are three kinds: the mellow peaty loams; the acid peaty loams and sandy loams, and the peats and loamy peats. The mellow peaty loams are moderately acid and have a moderate supply of plant

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6 ft.	11	880
8 ft.	8.25	660
8 ft. 3 in.	8	640
9 ft.	7.33	587
10 ft.	6.6	528
12 ft.	5.5	440
14 ft.	4.71	377
15 ft.	4.4	352
16 ft.	4.125	330
16 ft. 6in.	4.0	320
18 ft.	3.67	293
20 ft.	3.3	264
22 ft.	3.0	240

Staples—

Post: 1¾ in. x 7 or 1½ in. x 8, 42 staples weigh 1 lb.

Batten: 1 in. x 12, 200 staples weigh 1 lb.

foods. They make good farm lands. The acid peaty loams and sandy loams require topdressings of lime and potash in addition to phosphates. Farming is difficult when buried logs and stumps appear on shrinkage of the peat, and there is an ever-present risk of the soil taking fire during dry weather. The peats and loamy peats are very acid and poorly supplied with plant foods. They are extremely difficult to farm.

7. *Skeletal Soils*

The skeletal soils cover the steep hill country and are for the most part shallow soils closely related to the parent rock. Under the natural bush cover they have thin fertile topsoils, but the subsoils vary widely, according to the type of rock underlying. Where they are derived from such rocks as calcareous sandstone and mudstones the subsoils are neutral in reaction and are well supplied with plant foods, but where they are derived from poorer rock types, such as greywacke and siliceous sandstone, the subsoils are poor and acid.

Skeletal soils with a fertile subsoil are found in the Taumarunui area, near Taihape, and near Gisborne. Those with an acid, infertile subsoil occur mainly on the steep land extending from Wellington northward to East Cape, and in the North Auckland Peninsula. In the central part of the North Island the steep land is covered with pumice ash, which gives rise to soils of low natural fertility. Much of the steep land is still covered in forest. Where the land has been cleared the thin topsoil has for the most part been lost by erosion, and hence only those areas with fertile subsoils have been farmed successfully. Where the subsoils are poor and acid much land formerly grazed has now been abandoned and has reverted to fern and scrub. The efficient utilisation of our steep land, which accounts for half the total area of soils in the North Island, is one of our major problems.

Acknowledgment

Thanks are expressed to the Lands and Survey Department for the sectional drawings of the soil maps used in this article.

Immature brown loam near Hamilton.

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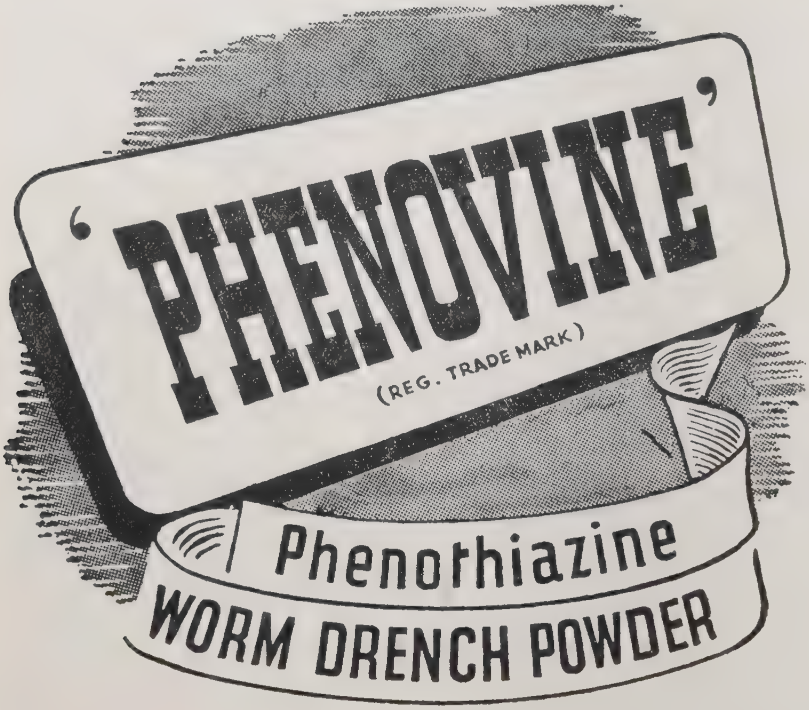

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FARMING PUMICE COUNTRY

SOME forty years ago a curious wasting disease affecting cattle and sheep was reported in the Tauranga district, where it was known for a short time as Tauranga disease. With the development of land in the County of Rotorua, particularly in the bush country of Mamaku and Kaharoa, a similar condition to Tauranga disease was very soon noted in ruminant stock after from 6 to 12 months' pasturage. This so-called disease was often spoken of as "the skinnies," or more commonly "bush sickness." Later still farmers in the Taupo County and the South Matamata County also complained of severe stock losses from an obscure wasting complaint that seemingly defied all types of treatment. In these instances, however, it was almost entirely open fern and tussock country that gave rise to the trouble, thus demonstrating that the popular name of "bush" sickness was a misnomer.

By

C. R. TAYLOR,

Fields Instructor, Rotorua.

DURING the period of its almost unchecked incidence, extending over a third of a century, this malady was the greatest single hindrance to the normal development of the pumice country, just as the discovery of the remedy of this deficiency disease was one of the greatest triumphs of agricultural science. Mr. B. C. Aston, late chief chemist of the Department of Agriculture, together with a small but enthusiastic band of co-workers, was responsible for a tremendous amount of research into this problem, and it was he who first introduced limonite in 1931 as a practical preventative and remedial treatment of bush sickness. His name will be chiefly remembered in this connection, for he retrieved the fortunes of hundreds of farmers by his discovery that the complex iron ore finely powdered and mixed with salt (50:50) as a lick, or suspended in water and used as a drench, both cured bad cases of bush sickness and also successfully prevented its development.

At this time it was held that a deficiency of iron in the soil and pastures was responsible for bush sickness—hence Aston's use of, inter alia, the iron compound "limonite." Later Australian and New Zealand research workers showed that limonite owed its potency to its cobalt content.

Pumice Country Sound

Nowadays nobody in the pumice country talks of bush sickness, for there is no evidence of that condition in stock. Simple cobalt-salt licks and cobaltised fertilisers have made the pumice country as economically sound as any other farming district of the Dominion. The productivity of the average dairy herd now bears favourable comparison with figures that could be assembled by any other dairying centre of repute, while the butterfat yield per acre ranges from 120lb. to 200lb. Where dairying is not carried out three breeding ewes per acre can safely be wintered on the average well-managed farm, and about two-thirds of their lambs—chiefly Southdown cross—can be delivered to the works as 32-36-pounders during January and February.

In addition to the ewes one cattle-beast of the beef breeds to 3 acres can also be carried satisfactorily. In numerous instances small flocks of breeding ewes are now carried along with dairy herds, and these usually do very well following the cows, especially the lambs, which often average 40lb. and more relatively early in the season.

In support of the above general observations it will be of interest to examine figures compiled by the Government Statistician and summarised annually in the A. and P. statistics. Those presented refer to the Rotorua, Tauranga, and Taupo Counties only, but from the writer's intimate knowledge of the southern portion of the Matamata County, including the districts of Putaruru, Lichfield, Puketurua, and Tokoroa, readers may be assured that equal progress has taken place in this area.

These figures reveal that in 15 years from 1926 permanent pasture has increased 47 per cent.; dairy cows have increased by 113 per cent.; other cattle by 55 per cent.; sheep shorn 200 per cent.; lambs tailed by 210 per cent.; milking machines by 151 per cent., and shearing stands by 230 per cent. Although there is only half as much again of permanent pasture in 1941 as in 1926, the number of dairy cows has more than doubled; other cattle have increased by more than

Year.	Acs. in perm. pasture.	No. dairy cows.	No. other cattle.	No. sheep shorn.	No. lambs tailed.	No. milking machines.	No. shearing stands.
1926	172,954	32,214	40,209	55,298	37,595	458	56
1931	226,256	48,953	50,243	80,096	45,739	683	71
1936	258,740	69,435	43,645	79,896	52,734	897	95
1941	265,314	68,534	61,792	165,184	119,577	1,151	185

GENERAL VIEWS OF PUMICE COUNTRY

half, while sheep shorn and lambs tailed are now three times as great.

The slight decrease in dairy cows and the tremendous increase in sheep in 1941 is undoubtedly a reaction to wartime conditions. The figures are, however, conclusive evidence of the huge increase in carrying capacity between 1931 and 1941, or from the time cobalt-bearing limonite and, a few years later, cobalt salts were first made available. Corroboration is given in the great growth in output of the Ngongotaha butter factory from 350 tons in 1926 to 1,584 tons in 1941; and of the Tokoroa cheese factory from 210 tons from 28 suppliers to 736 tons from 41 suppliers within the same period.

More recent data concerning the number of fat lambs railed to the works through the Rotorua station are typical of the numbers sent through other centres such as Putaruru, Tauranga, and Te Puke. The stock detailed below was drawn from the Rotorua County only:—

Season.	No. of lambs.	Average weight over season. lb.
1938-39	17,977	31½
1939-40	16,911	34½
1940-41	22,699	36½
1941-42	33,248	35
1942-43	47,028	35½

The numbers of fat lambs railed to the works, together with their average weights, are an excellent criterion of the progress made in the pumice country since the advent of cobalt for the very good reason that it was always well known that lambs were highly susceptible to bush sickness. The figures quoted have been obtained from reliable sources, but owing to the work involved in compiling them, no attempt has been made to go back beyond the season 1938-39.

Actual Experiences

A few actual experiences of farmers before and after the discovery of limonite, and later cobalt, follow. One man at Tokoroa in the 1930-31 season milked 50 cows on 130 acres for the production of 10,000lb. butterfat. The herd was a fairly well-bred one, and there was no shortage of feed or lack of general attention. In the 1942-43 season the same farmer milked 85 cows on a little over 200 acres, besides running a few breeding ewes and several head of young stock for a production slightly exceeding 24,000lb. fat. This season 108 cows (inclusive of 30 heifers) are in the herd, and yield to date promises to be over 30,000lb. for the season.

Still a further example of actual experience of cobalt topdressing comes from the Native Department, Rotorua, concerning an area of land known as the Tihiotonga Block. Of a total area of 2,600 acres approximately 2,000 acres are in good permanent pasture. Before the use of cobaltised topdressing it was found practically impossible to keep sheep on the property for more than six months at a time without their developing bush sickness, and it was utterly hopeless to think of fattening lambs or bullocks. In these circumstances it became the customary practice of the management each season to remove all breeding ewes to healthier country just prior to lambing, while cattle would be treated in much the same way but at longer intervals. Fresh lines of stock would then be brought in to replace those shifted, and so the process would be repeated from year to year.

Since cobaltised fertilisers have been regularly used—approximately 6 to 7 years at 2 to 3cwt. annually—the general position on this property has so vastly improved as to be hardly credible. Last winter, for instance, with 100 acres of swedes and 1,900 acres in grass, the stock carried was as follows:—

1,278 bullocks (2½-3½-year-old).
900 breeding ewes.
480 hoggets.
200 dry ewes.
286 wethers.

The bullocks had been brought on to the property in April, 1944, and by January, 1945, over 600 had been slaughtered at an average weight of 850lb. By May, 1945, it is expected that at least 1,200 of the 1,278 will have been disposed of for an all-over average of 800lb. In the 1943-44 season 800 bullocks and 400 cows were fattened for averages of 850lb. and 640lb. respectively.

The 900 breeding ewes wintered produced slightly in excess of 100 per cent. lambs (a figure somewhat lower than that obtained over the past few years), and it is anticipated that the majority of these will go to the works as fats about mid-February, the balance being fattened and disposed of by the end of May. Last season's over-all average weight for fat lambs was 37lb.

Following the disposal of roughly half the wintered bullocks by the following December-January, and approximately 75 per cent. of lambs by mid-February of each year, it is necessary to purchase extra stock to consume the prolific pasture growth always available during the late summer and autumn. In January of this year 1,500 shorn wether lambs were bought, and of this number most are expected to fatten and be ready for disposal by the end of May, the few that are left being retained and sold as fats in the following November or December. Last season 2,100 4-tooth wethers were handled as just described, and all but the 286 referred to previously as being wintered on the property were fattened by the end of May, 1944, averaging 70.9lb.

That other factors have played their part in this vastly improved position of animal health and productivity, apart from the use of cobalt in licks and fertilisers, must be admitted. Of importance in this connection is the now almost universal use of Government-certified strains of seeds; the more regular employment of greater quantities of artificial fertilisers for topdressing purposes; improved water supply systems; herd testing; more rigid culling, and better attention to breeding problems.

Cobalt Essential

Nevertheless, it is a fact that the best pasture and farm management could not succeed in keeping stock healthy without that essential element. This is not to overstate the position in any way, for from the writer's own experience of the "bad old days" scores of apparently well-fed and otherwise carefully attended dairy herds did well if they succeeded in averaging 150lb. fat per cow. More often than not the figure hovered around 120lb., while in all too many cases useful-looking animals would yield only 80-100lb. for the season. Likewise grown sheep would literally "die like flies" within 12 months of

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HEALTHY AND BUSH-SICK STOCK

Left.—Four-year-old ewes on same farm as shown in photo below. These ewes had been given a limonite-salt lick for seven months and remained perfectly healthy.

Right.—Breeding ewes showing various degrees of bush sickness. Most of the ewes had died within six months of the photograph being taken.

Left.—Young stock reared successfully on one-time very bush-sick country.

Right.—Four years old when this photograph was taken, this cow had never had a calf. After a course of limonite she completely recovered and calved the following spring.

their coming into the bush sickness areas; lambs, of course, refused to fatten, the majority dying before Christmas unless disposed of before this time. Consequently it was a common practice to sell ewe and lamb together to some outside buyer whenever possible, the seller purchasing a fresh line of 5- to 6-year-old ewes each year. Rearing calves was also a tiresome and heart-breaking job, many dying before weaning time, and of those that survived this period most would be casualties before the following winter was over.

The provision of farmers' finance soon became something to be dreamed, but rarely secured. Banks, stock firms, other lending institutions, and even the Government soon became chary of advancing financial assistance to hard-pressed settlers after a short but costly experience in pumice-country securities.

Effect on Management

This is a brief outline of the average conditions obtaining in the pumice country before the advent of limonite and cobalt, and what the discovery of these substances has meant to the farmer and those that trade with him. But what do these discoveries involve in terms of general farm management? Actually very few differences exist today between the treatment of what might be called normal country and pumice country. The making good of a cobalt deficiency is, of course, the chief point of difference, and this is very simply achieved by topdressing with a prepared cobaltised fertiliser such as cobaltised superphosphate or cobaltised serpentine superphosphate. It has been found that 5oz. cobalt sulphate per acre per annum is adequate, i.e., 1cwt. of cobaltised superphosphate containing 6lb. cobalt sulphate per ton. Should more phosphate be required over and above the amounts supplied in the cobaltised fertilisers, then straight superphosphate or serpentine superphosphate can be employed at a slightly lower cost. Cobalt licks are quite unnecessary when cobalt topdressing has been applied.

Unlike many other soil types, pumice land is not very responsive to lime. Phosphates, however, are as naturally lacking in the pumice soils as in most other soils of the Dominion, and 3cwt. per acre (when available) of superphosphate or serpentine superphosphate regularly applied is ample to meet this deficiency and maintain stock and pastures at a high level of productivity.

The following table serves to indicate the general trend of fertiliser consumption for the period between 1926 and 1941. The increased consumption noted is largely consequent upon the discovery of cobalt, the farmers' economic position having so improved as to enable him to apply more and more fertiliser to his pastures.

Station.	1926. tons.	1931. tons.	1936. tons.	1941. tons.
Rotorua ..	1,699	3,528	5,250	12,369
Mamaku ..	118	129	151	267
Putaruru .	8,188	9,811	11,417	16,979

The tonnages indicated were delivered through the railway stations mentioned.

Pasture management in the pumice country today is very similar to that practised in other progressive districts. In general practice certified strains of grass and clover seeds definitely produce the best results, and consequently should be employed whenever possible. On some of the coarser pumice-soil types cocksfoot grows far more naturally than does perennial ryegrass, and for this reason should be used more extensively than it is in permanent pasture mixtures, ryegrass being reduced in quantity proportionately.

Whereas in the period when bush sickness was prevalent it was almost impossible to control pasture growth by grazing alone, owing to the poor and depraved appetite of affected stock, nowadays, with an average winter of four months to prepare for, it is quite unnecessary to do the amount of topping that at one time was common on cobalt-deficient farms and destroy this valuable surplus material by burning. With present-day carrying capacity and stock normality very little feed goes to waste; in fact, to secure sufficient hay, ensilage, or both to cover requirements over the winter season adequately it is usual each spring to shut up from a quarter to one-third of the grassland on the farm. Such areas are generally closed either in September, October, or November, after receiving a good dressing of cobaltised fertiliser, the November cuts generally being ensiled, while the later ones are saved for hay.

All breeds of dairy and other cattle today give equal satisfaction in so far as their general health is concerned. No longer is it necessary to choose breeds for their natural superior stamina, which enabled them to resist more strongly an onset of bush sickness. At present Jerseys far outnumber the total of all other breeds, but this is not to infer that the Jersey is the only type worthy of consideration, reference merely being made to it because at one time the breed was very commonly regarded as being more susceptible to bush sickness than any other type.

Sufficient has been said, it is hoped, to bring into high relief the wonderful progress made in the past 10 to 15 years, largely as a direct result of the introduction of cobalt, and to remove for ever the stigma of bush sickness from the pumice lands. Great as has been the advancement made in the period under review, it will, however, prove insignificant in comparison with the future of the vast area of volcanic land still awaiting the attention of man.

Readers are referred to the Department of Agriculture's Bulletin No. 180, "Cobalt Deficiency in Sheep and Cattle," which has been prepared in collaboration with the Cawthron Institute and is available from offices of the Department of Agriculture at Auckland, Wellington, Christchurch, and Dunedin. This bulletin gives up-to-date information relative to all methods of correcting cobalt deficiency.

◆

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Curing and Tanning Hides and Skins.

SKINS of livestock and game killed on and about the farm are frequently left about and forgotten because farmers have no handy reference to curing and tanning recipes. Cured skins can be put to a multiplicity of uses, and a useful collection of recipes and tanning and curing hints follows.

THE following method requires a great deal of work, but it is a very good one for tanning large skins. It is, of course, good for small ones also:—

Soak the skin in warm water, stretch, and thoroughly scrape the flesh side. Then apply a paste made of equal parts of saltpetre, borax, and glauber salts moistened with water; fold the skin, flesh side in, allow it to lie for 24 hours, then wash in warm water. Next apply to the flesh side a mixture made by melting together 2oz. of good soap, 1oz. of washing soda, and ½oz. of borax. Fold up the skin and allow it to lie for 24 hours. In warm weather watch should be kept on the skin when it is lying folded.

Make up a solution by dissolving 1lb. of alum and 2lb. of salt in a paraffin tin full (4 gallons) of hot rain water or other soft water. When the solution has cooled to the point that it does not burn the hands put in the skin and allow it to soak for 12 hours; take it out, wring it, and hang it on a rope or riem for another 12 hours. This last soaking and drying should be repeated till the desired degree of softness is obtained. The usual stretching, rubbing, and twisting complete the work.

Loosening the Hair

Hair on the hides may be loosened by several different processes. One method consists of painting the hair side with a 30 per cent. solution of sodium sulphide, thickened with lime. The skin is then folded up, hair side in, and left to lie for a few hours, when the hair can be removed by scraping. In another process (a cheaper one) the skin is immersed in a vessel containing milk of lime. The liquid is stirred daily, and after a few days the hair on the skin becomes loose.

Sheep, Lamb, or Goat Skins

Make a strong lather with hot water and soap (but use it when cold) and wash the fresh skin, being careful to get all the dirt out of the wool. It is best to plunge the skin right into the lather. After being well washed, the skin should be rinsed in clean cold water. Next dissolve 1lb. each of salt and alum in 2 gallons of hot water (if the skin is very large it may take more, but that is the proportion of the mixture), soak the skin in this solution for 12 hours, and then hang it on a pole to drain, flesh inwards. When well drained stretch it upon a floor or board to dry, stretching it several times during the process of drying. A good plan is to nail it wool downwards so that the air can pass underneath.

Before it is quite dry sprinkle it on the flesh side with 1oz. each of powdered alum and saltpetre, and rub this well in. If the wool is then found to be firm on the skin, it can be folded up and allowed to dry thoroughly, turning it over from day to day. Then scrape the flesh side with a blunt knife and rub it with pumice-stone or fine sandpaper. Plenty of stretching and working is the secret of getting the skin white and pliable.

Curing Calf Skins

In one quart of water thoroughly dissolve 12oz. alum, 4oz. salt, 4oz. oatmeal, 2oz. saltpetre. Rub this mixture thoroughly all over the skin of the flesh side and fold (flesh to flesh). Allow the skin to remain for three weeks, turning once weekly.

The skin should then be exposed to the wind and air until it is half-dry, when any flesh should be scraped off and the skin should be pliable; then dry thoroughly. It is then fit for use.

Making Greenhide Leather

After cleaning the hide and freeing from hair by the ordinary process, the stock is steeped or paddled in a solution of bichromate of potash and sulphuric acid, 5 per cent. of chromate to 2½ per cent. of acid on the wet weight of the stock. When this solution is thoroughly absorbed the stock should be a canary yellow throughout. Then remove the stock from the bath and spread it out flat to drain overnight. Next immerse in a solution containing 7½ per cent. of hyposulphide of soda (ordinary hypo) and 2½ per cent. of sulphuric acid, again estimated on the original wet

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weight. When this reducing bath has completed its work the leather should be a pale green, and should stand boiling without going hard or curling up. This latter test is a proof of well-tanned leather.

This leather dried out is known as "chrome sole," and can be made waterproof by impregnation with paraffin wax. Care should be taken in the latter process to keep the wax at as low a temperature as possible while immersing the leather in it.

Removing Wool

Dissolve 1lb. caustic soda in 2 gallons of water; add sufficient slaked lime to make a good thick paste; apply this with a brush to the flesh side of the skin; fold skin over lengthwise, wool side out; leave until next day; then pull wool off the skin. One must wear leather gloves when painting on the paste, also when pulling the wool off the skin, so as to avoid burning the hands. The skin must be thoroughly soaked in water a little while before the paste is applied, the degree of soaking depending on its dryness.

Curing Rabbitskins

Mix bran and soft water sufficient to cover the skins. Immerse them and keep them covered for 24 hours, then remove, wash clean, and carefully scrape off all flesh; then take 1 gallon of hot water and dissolve in this 1lb. alum and ¼lb. salt. Cool so that the hand may be put in. Immerse the skins for 24 hours, dry partially by rubbing, then immerse the skins for 24 hours in oatmeal and warm water; partially dry in the shade and finally rub until entirely dry. This leaves the skins like white leather and fit for use.

Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

May 7, "Work on the Farm for the Coming Month," by Mr. E. B. Glanville, Acting Fields Superintendent, Fields Division, Department of Agriculture, Auckland, and Mr. P. S. Syme, Instructor in Agriculture, Department of Agriculture, Warkworth.

May 14, talk to be arranged by the Poultry Instructor, Department of Agriculture, Auckland.

May 21, "Conditions Met with in Wintering Calves," by Mr. H. Doyle, Veterinarian, Department of Agriculture, Hamilton.

May 28, "Y.F.C. Session," by Mr. D. S. Ross, Past President, Young Farmers' Clubs' Federation.

Installation of Rams

An efficient ram will raise water 30 times the height of the fall, though 25 times is the normal limit, and the greatest height to which water is to be raised should not exceed 200ft.

A ram will drive one seventh of the water passing through it four times the height of the fall, or one fourteenth part eight times the height, and so on. While rams will work under a minimum head as low as 18in., the optimum is 8ft. Above 10ft. head the water causes such shock to the valves that they wear quickly. The delivery pipe should be one half the diameter of the drive pipe, and the drive pipe should be at least 30ft. long and fitted wtih an intake screen. Rams are listed according to size, and the following are the outputs of popular sizes.

No. 1: 10—20 gals. per hour.
" 2: 15—30 " " "
" 3: 30—60 " " "
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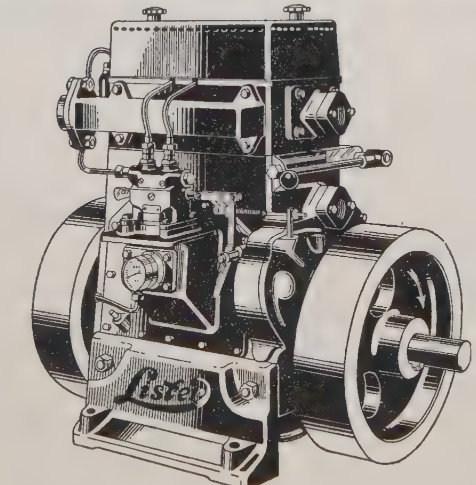

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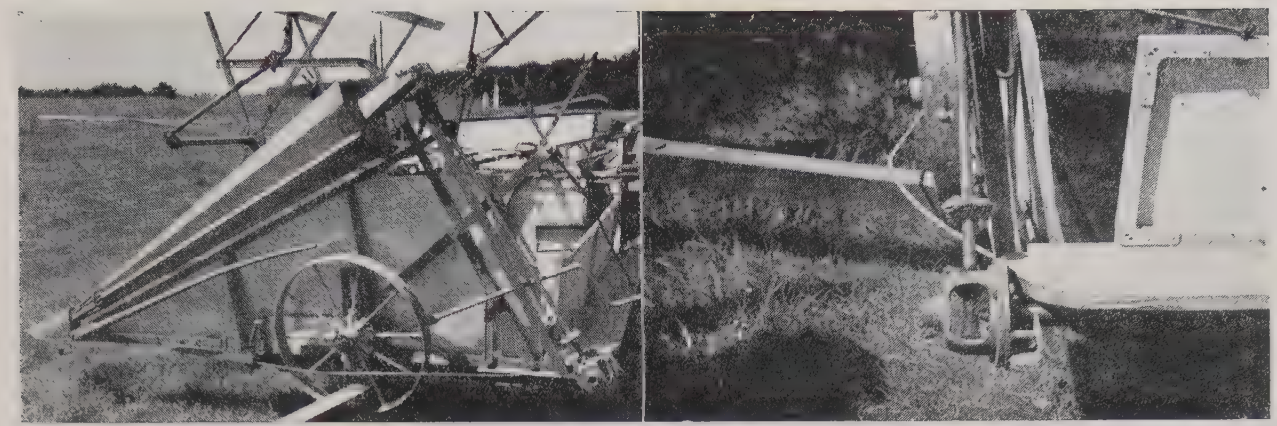


Left.—View of shedder cone and two of the three sets of cogs required to drive cone. Right.—The two driving shafts and bevelled cogs on crop side at back of binder platform.

The Rotary Shedder

FARMERS, particularly those on the heavier soils, realise that much grain or seed is lost through their binder being unable to handle efficiently a badly lodged or tangled crop. The difficulty, of course, is to separate the cut swath from the remainder of the crop, or in other words to shed the crop. The most modern power binder is useless if its shedder will not handle the material efficiently.

By

W. L. HARBORD,
Fields Instructor,
Invercargill.

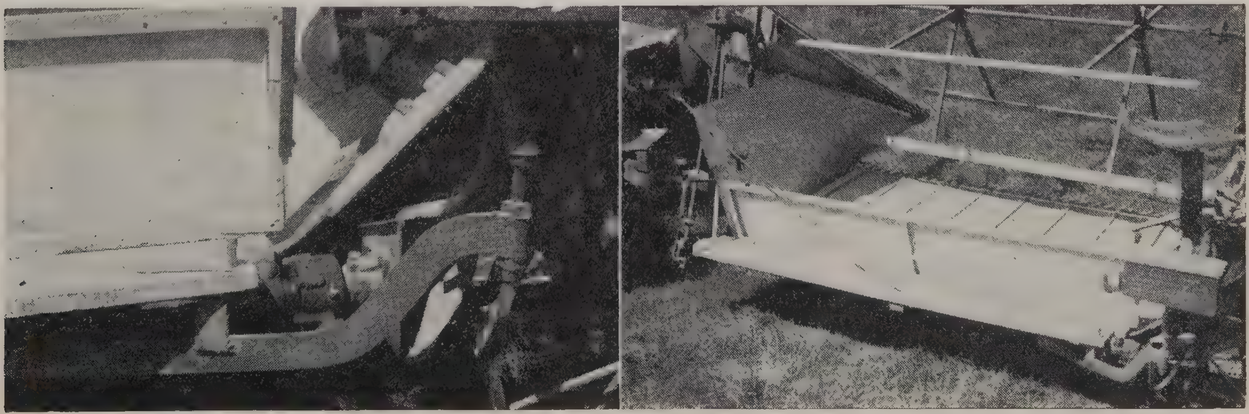
DIFFERENT types of shedders have from time to time been improvised by farmers, but best results to date would appear to be obtained with a rotary or revolving shedder. This type of shedder was first used in Southland some 30 years ago, but it was not until fairly recent years that its reputation was established as a really useful attachment to a binder. The shedder consists in the main of an eight-sided wooden cone, which revolves clockwise and is fitted to the binder at an angle of 45° above and extending to a point in line with and approximately 3ft. in front of the outside edge of the knife. When the binder is in motion the cone of the shedder revolves, lifting and separating lodged crops. Also it will separate standing crops which are badly tangled in the head, a condition which is experienced in a heavy crop of turnip seed.

A very useful type of rotary shedder has been made and fitted to a number of binders of all types in Southland, and it is considered that the horse-drawn binder with a rotary shedder attached can separate the crop just as efficiently as a power-driven binder when handling a lodged and tangled crop.

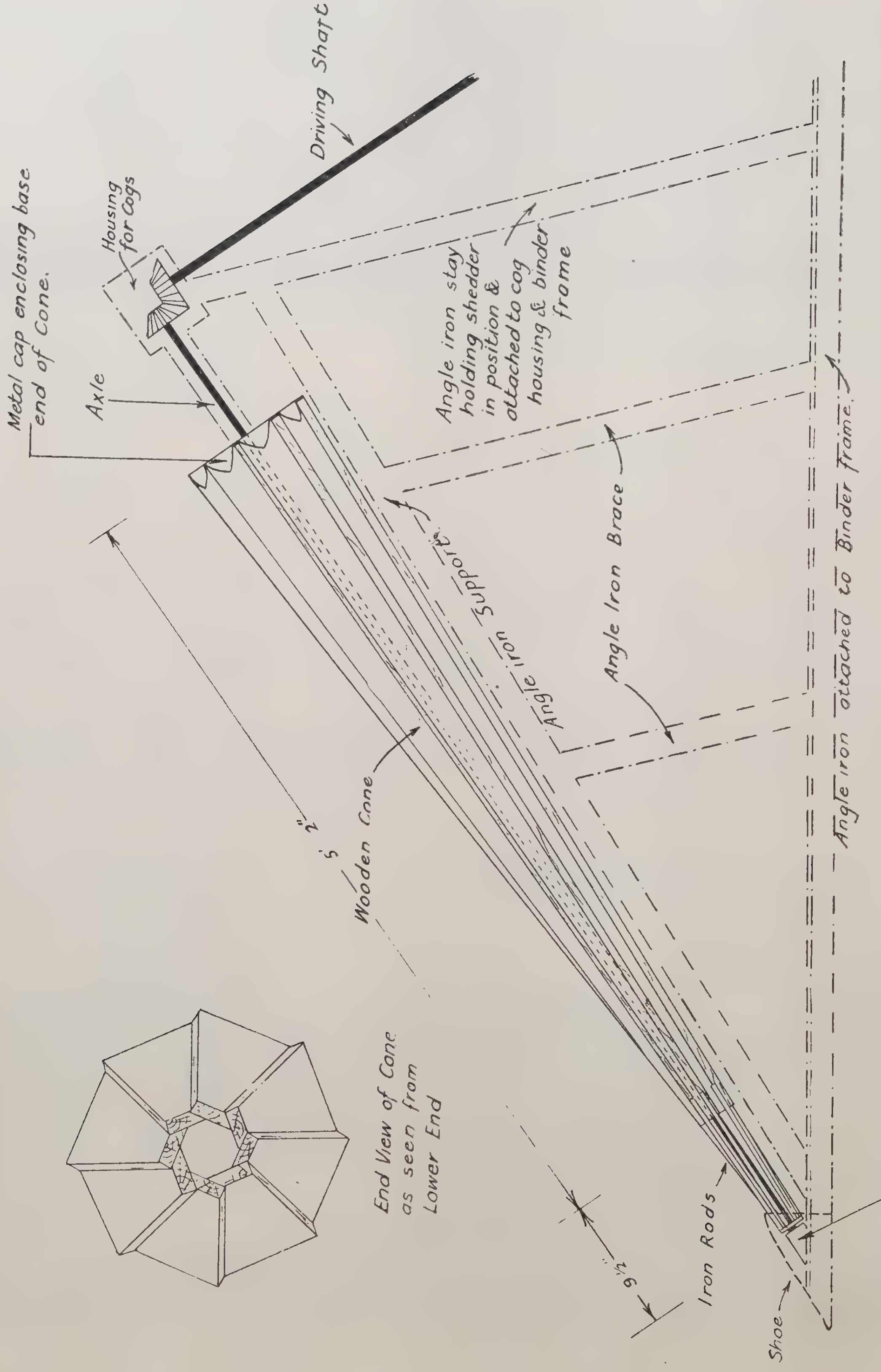
Construction of Cone

The cone is made for the greater part of ¾in. dressed timber, which consists of eight boards each 5ft. 2in. long. These boards are all tapered and are bevelled on one edge. On the outside (when assembled) each board measures 3¼in. wide at the base end and ¾in. wide at the peak end. The corresponding measurements on the inside are 4in. and 1½in. Built to these measurements, the cone has an outside diameter of 10in. at the base and 2¾in. at the peak.

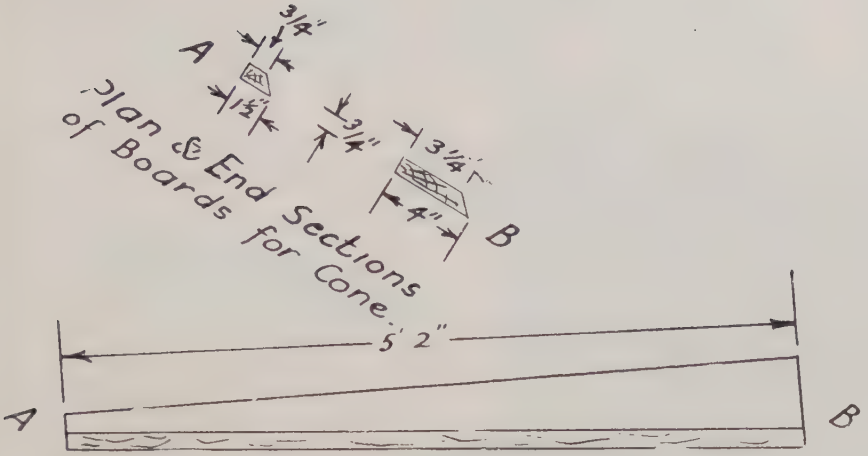
The completed cone has an iron extension to the wooden part described above, and this continues for another 9½in. at the peak, or, actually, the lower end. This section consists of eight ½in. round iron rods, each approximately 11¼in. long. These rods lie in the recesses on the outside of



Left.—Part of driving shaft (beneath wooden platform) and casing enclosing cogs which transmit driving power from inside platform roller. Right.—Showing position of each of driving cogs, wooden cone, and iron rods on front of cone.


Metal cap enclosing base end of Cone.
Housing for Cogs
Axle
Driving Shaft
Angle iron stay holding shedder in position & attached to cog housing & binder frame
Angle Iron Brace
Angle iron Support
Wooden Cone
5' 2"
Angle iron attached to Binder frame.
9½"
Iron Rods
Shoe
Bearing made from ¾" pipe to carry cone axle

End View of Cone as seen from Lower End



the wooden cone created by the "weather boarding," and extend beyond the end of the wood for 9½in. of their length. As the front ends of the rods are welded to a flange, the diameter of which is about 1¾in., and the rear ends slide into the recesses on the wooden portion of the cone, this iron section of the cone forms a perfect continuation of the wooden cone.

The Axle

Through the centre of the flange passes the central or main axle of the cone. This axle is of ½in. steel and extends past the above-mentioned flange for another 2in. to allow it to lie into the front bearing on which the cone must revolve. This front bearing on the machine illustrated was a ball-race bearing. The front ends of the axles of many shedders revolve in a piece of ¾in. piping fitted with a grease nipple and welded on to an extension of the original shedder of the binder. A shoe forming the tip of the shedder encloses this bearing, and the tip is about 3ft. in front of the knife.

The axle, of course, passes through the whole length, extends past the base of the cone for 10in., and couples on to the first set of drive direction change cogs. To give strength to the cone and to hold the axle in position a flat iron plate encloses the base of the cone and encircles the axle.

Power for Shedder

As power to drive the shedder is taken from the axle of the inside roller of the platform canvas, it means that this power must be transmitted along the back to slightly beyond the outside edge of the platform of the binder. Here a set of change cogs is necessary to allow the power to be taken more or less vertically to the change cogs at the end of the cone axle. The two power-transmitting rods necessary are each of the same material as in the axle of the cone, i.e., ½in. steel.

The speed of the power-driven platform roller is too fast to drive the shedder cone, and a 3½ to 1 reduction in speed is necessary. This is obtained by using an old set of both Ford and Chevrolet motor-car differential gears for the direction change cogs at the platform roller, and at the next change, i.e., from horizontal to more or less vertical. The Ford cogs are fitted at the platform roller and the Chevrolet cogs at the next change. At the third power direction change from the platform roller, i.e., at the base end of the cone axle, two even cogs are fitted. By fitting these cogs as described above, the necessary 3½ to 1 reduction in speed is obtained, and the speed of the cone is then satisfactory. All cogs are enclosed in casings, which in turn are directly attached to the frame of the binder. The axle and the power-transmitting rods ride in the actual casings, and support and rigidity are given to hold the various parts in their correct position.

Thanks are expressed to Messrs. A. G. Heenan, South Hillend, and W. Allison, Drummond, for their assistance in the preparation of this article.

Sheep Dipping

Points in the design and construction of sheep dipping baths are the subject of the Department of Agriculture's Bulletin 181. Mr. J. E. Duncan, Wool Instructor, has in this bulletin endeavoured to cover concisely all the aspects of dipping. It is designed to fill a definite want, as most of this information has formerly been scattered or available from commercial firms only.

This bulletin is free and copies may be obtained from the Department of Agriculture, Wellington.

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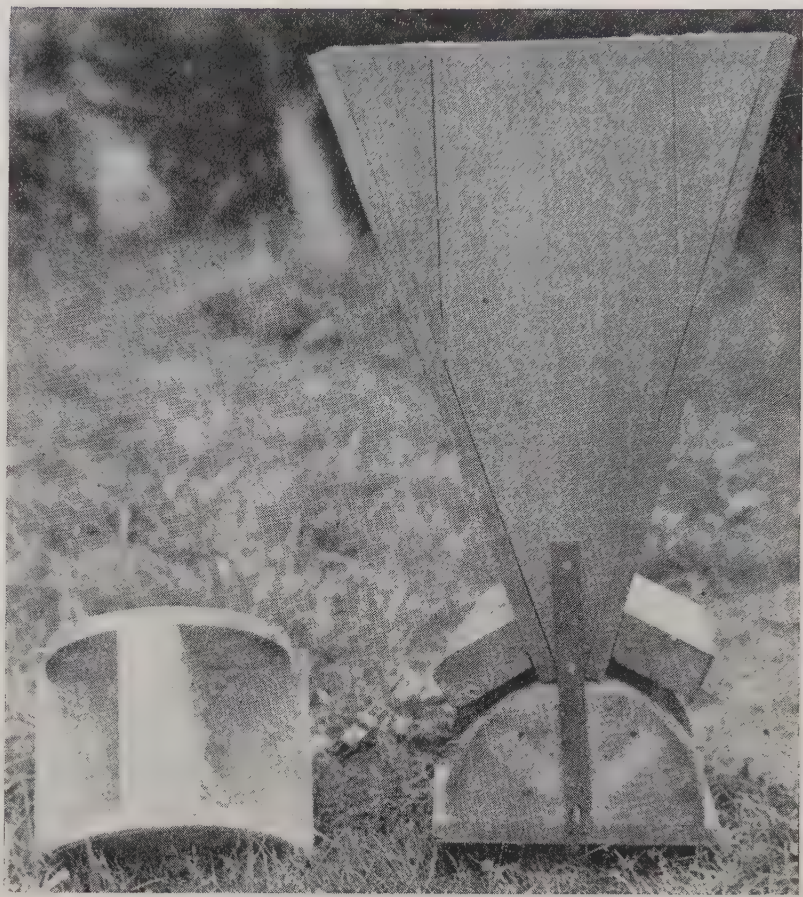
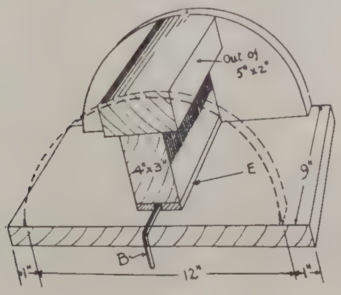
By
A. T. SHANNON,
Field Economist,
Hamilton



A MEAL feeder for milking cows which will appeal to the small farmer has been devised by Mr. E. Ennion, of Horsham Downs, Waikato. Situated on the cowshed wall in the dummy bail this feeder is filled with meal, and when a cow enters the bail the rotating lower portion is tipped to empty into a feed box on one side of the dummy. When in this position the meal automatically runs into the other half of the rotating portion and stops when it is full. This can then be tipped to empty into the feed box on the other side of the bail. The advantage of this feeder is the ease of feeding a measured quantity of meal to each cow during milking.

In the photograph the rotating part is shown in the midway position. The diagram is slightly different from the photograph, but incorporates some improvements which simplify the design. Dressed inch timber is used throughout, the axle being ¼in. iron rod, held in position by iron straps 1in. x 12in. x ¼in.



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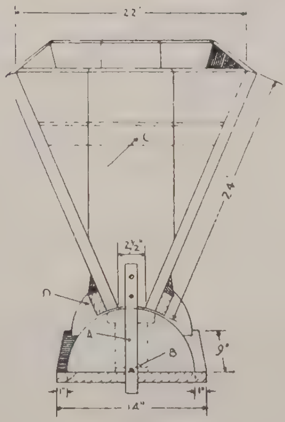

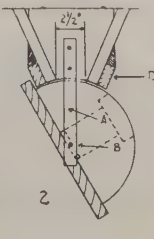

2

1. Side view. 2. Meal tray fitted. 3. Construction of tray. A. 12in. x 1in. x ¼in. w.i. strap. B. ¼in. rod forming pivot. C. 2in. x 1in. cleat. D. 2in. x 1in. stop. E. 5/16in. thick hardwood battens on either side of pivot rod.

CANTERBURY
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The Canterbury Agricultural and Pastoral Association desires to intimate to breeders and prospective exhibitors that the Metropolitan Show will be held on the Showgrounds, Addington, in November, 1945.

A full Schedule of Stock Classes will be issued in September.

M. E. LYONS,
Secretary,
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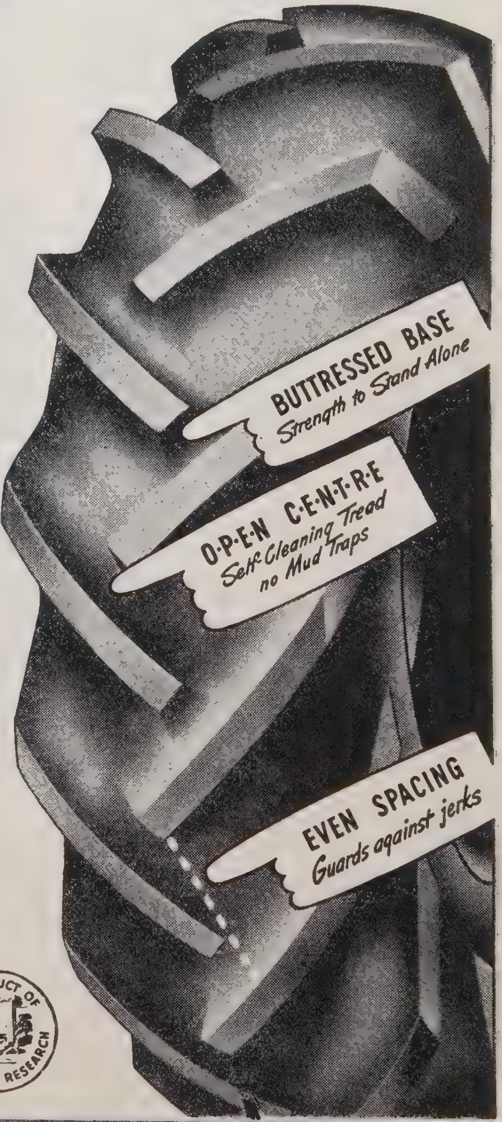

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VETERINARY NOTES

Gastro-Intestinal Parasites in Calves

CONSIDERABLE losses are experienced annually in New Zealand through the ravages of gastro-intestinal parasites in calves. Seasonal conditions experienced this year are such that perhaps more than average trouble may be experienced. Control measures properly applied can save the farmer considerable financial loss and worry.

The wormy calf appears stunted, emaciated, anaemic, hidebound, the coat is harsh and dry, and persistent scouring is present. In severe cases death may intervene, generally in the late autumn or winter. Even if severely-infested animals survive, their constitution is seriously undermined. In fact, the wormy calf of today is the unprofitable cow of tomorrow.

Internal parasites of calves may be broadly divided into two groups, those which inhabit the lungs and those found in the fourth stomach or abomasum and intestines. The latter group are the more important. Indeed, the view is widely held that lungworm infestation is of importance only when a heavy infestation of gastro-intestinal parasites is also present, and that control of the latter effectively keeps the former in check.

The scientific names of the various worms matter little to the farmer. There are numerous species, and it is generally found that the infested calf harbours several types of worms at once. The worms are small and threadlike, some being small enough to escape naked eye observation. The untrained observer can easily overlook the presence of a heavy infestation on post-mortem. Laboratory examination of stomach and bowels for worms or of dung for worm eggs quickly gives an indication of the extent of the infestation.

Under favourable conditions worm larvae can exist for long periods on the grass. With regular rainfall, lush growth, and heavy carrying capacity, New Zealand conditions are ideal for heavy worm infestation. Calves may become infested at an early age, and the infestation is built up during the summer and autumn. Obvious symptoms do not generally become apparent until late summer, and, unless control measures are applied, affected animals become progressively worse during the late summer and autumn.

Faulty nutrition or mineral deficiency are factors which may complicate worm infestation, and should be corrected at the outset.

Control of parasites depends first on regular drenching to rid the host of parasites, and second on rotational grazing to prevent re-infestation.

The introduction of phenothiazine has been a big step forward in the battle against parasites. There is no doubt that this drug is easily the most efficient for the purpose at the present time. It is somewhat expensive, and administration is not as easy as, say, with bluestone-nicotine, but the results are so good that these points can be overlooked. The dose of phenothiazine is from ½ to one ounce of the powder either in a drench or mixed with the feed.

Bluestone alone is still widely used. The results, while not as good as with phenothiazine, are generally satisfactory, and the farmer who has had good results from this treatment is justified in carrying on with it. **Dose rate:** Dissolve 8oz. of bluestone in 3 gallons of water. Dose for 4 months old calf 3oz., 6 months 4oz., 9 months 6oz., 12 months 8oz.

Tetrachlorethylene in liquid paraffin has been used to some extent, but it is doubtful if the results compare with the bluestone solution, and it is more expensive and more dangerous to administer.

It is doubtful if there is anything to recommend the use of turpentine or other non-specific agents to control worms in calves. Their efficiency certainly would not compare with that of any of the above treatments.

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The secrets of effective drenching are:—

1. **To drench early before calves show symptoms of worm infestation.**
2. **To drench regularly so that worms are dealt with as soon as they mature.**

Three-weekly drenching is necessary in many cases to keep the worms in check. The value of rotational grazing cannot be overestimated in the fight against parasites. It is probably impossible to prevent re-infestation taking place, but a change of paddock after each drench is the nearest approach to ideal.

It is well known that parasitism is much more prevalent on heavy, rich country than on poorer light country. In the first case, stocking is heavier, contamination of the pasture is heavier, and as a result, each calf gets a heavier infestation.

Supplementary feeding with concentrates has much to recommend it in keeping up the resistance and general health of the calf. Again, if supplementary feeding is to be resorted to, do not wait until obvious symptoms of parasitism are present.

To sum up, the farmer who has trouble with internal parasites of calves should:—

1. **Build up the resistance of the animals by a high standard of nutrition.**
2. **Drench early and regularly, using a reliable vermifuge.**
3. **Provide rotational grazing to prevent re-infestation of the calves.**

Such a programme should be easier and cheaper than burying his own calves and buying replacements.

—*R. P. GILDER, B.V.Sc., Veterinarian, Palmerston North.*

◆

Answers to Correspondents

Windsucking Mare

"J.G.," Wedderburn:—

I have a thoroughbred mare which is a bad windsucker and would be pleased if you could let me know it there is any cure for this complaint. The mare has been affected for a period of about 12 months.

LIVESTOCK DIVISION:—

Windsucking is a vice which, if allowed to continue, may have a serious effect on the health of the horse, and thus lead to unsoundness. It is very similar to crib-biting, except that a grip is taken on thin air instead of some part of the manger or fittings. In order to windsuck, the horse must extend the neck, thus tensing the muscles of the neck and jaws. When well-established it may be found impossible to break the habit, in which case the animal will gradually become useless for work. If, however, the habit is a fairly recent acquisition, it may be possible to cure by preventing the extension of the neck. Feed the animal on the ground, and when turned loose have it controlled by a head-stall with a strong strap tied short between the forelegs to a band around the chest, allowing sufficient play for a normal carriage of the head.

As windsucking is usually associated with crib-biting, it would be advisable to examine both the manger and the mare's teeth for evidence of excessive wear. If it is found to be a crib-biter also, you must adopt some means to discourage this. Feed on the ground, or smear a solution of bitter aloes over the parts of the manger used by the horse to bite on.

If treatment on the lines given above is unsuccessful, there is little else you can do, except get rid of the animal or keep it apart from others which might copy the vice.

◆

Rape as Greenfeed for Milking Cows

"V.A.D.," Taupiri:—

Could you please tell me if rape is good for milking cows as greenfeed.

LIVESTOCK DIVISION:—

Rape is grown chiefly for sheep or pigs. It is satisfactory for cattle, but dairy cows should be fed rape or grazed on the crop only immediately after milking, to avoid tainting the milk. To avoid danger from bloat or excessive scouring cows should not be left on the rape for more than half-an-hour. Only mature rape should be fed, maturity being indicated by the change of colour of the leaves from green to slightly purple.

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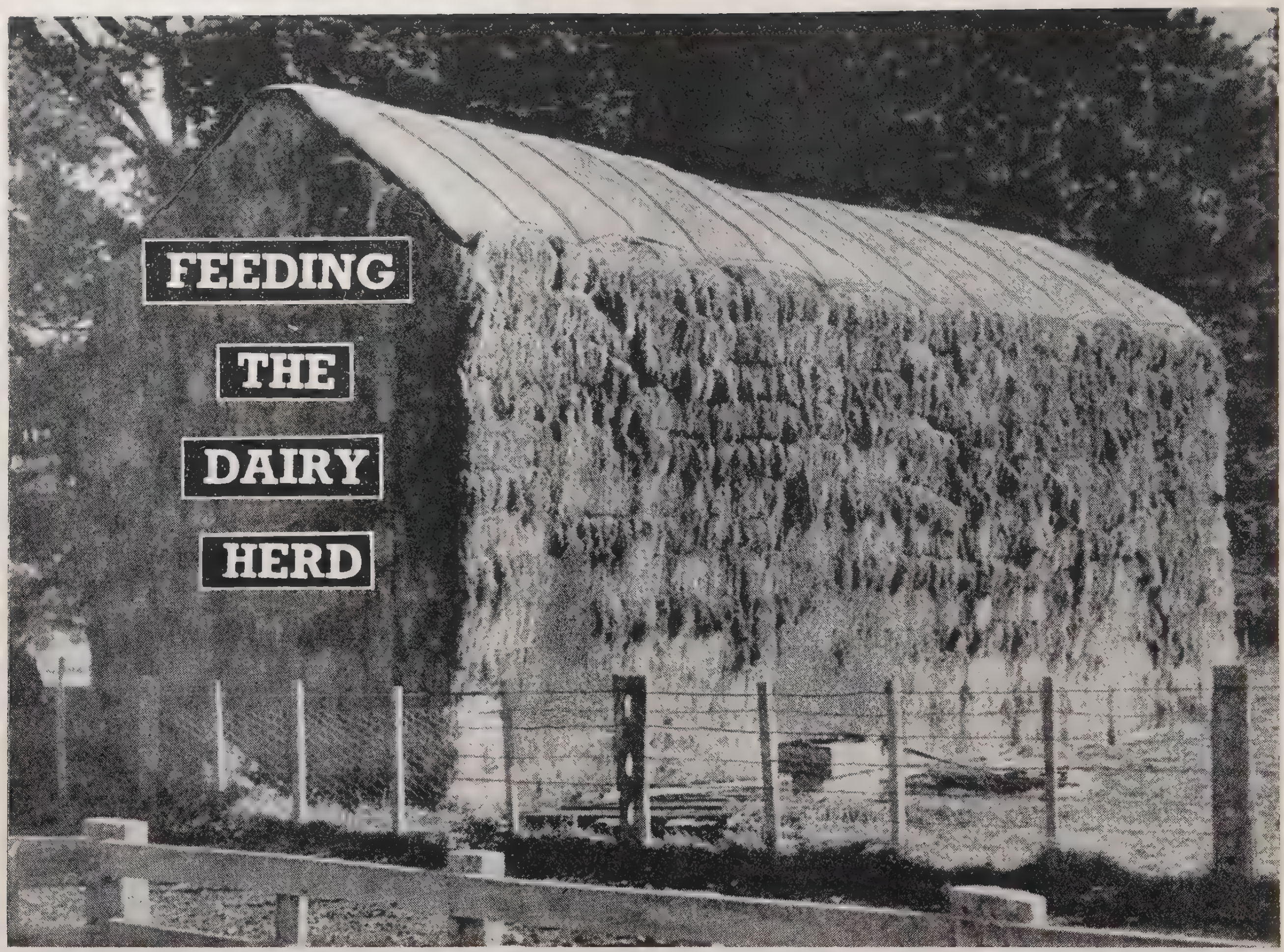

"N.Z. Farmer Weekly" photo.

★ Dairy production in the 1945-46 season depends very largely on the adequate feeding of cows during the coming winter.

★ Start feeding out hay in the late autumn or early winter BEFORE GRASS GROWTH STOPS.

★ Early feeding of hay allows grass to be saved for feeding IN LATE WINTER AND EARLY SPRING.

SEASONAL NOTES

Winter Spelling for Rationing Grass On the Dairy Farm

HIGH per-acre production on a dairy farm is usually found on pastures which contain a goodly proportion of ryegrass. When the majority of grasses are practically dormant ryegrass is capable of making reasonable winter and early spring growth. This characteristic may be exploited in producing grass for rationing to the early calving cows in the more favoured districts. Reasonable spelling and judicious lenient grazing on chosen paddocks will avoid unduly rank growth at any stage preceding rationing and keep the pastures growing.

It is well known that clover frequently becomes dominant in the spring if ryegrass is weakened by close and continuous winter grazing. Moreover, when the clover eventually comes away in the spring it often constitutes a dangerous flush growth, causing feed flavours in the cream and bloat among the best producers.

Number of Paddocks

Winter spelling has exactly the opposite effect in that the pastures become more grassy. The number of paddocks which may receive special treatment will depend on factors such as pasture conditions, winter feed reserves, subdivisions, winter carrying capacity, and rotational grazing technique. Four paddocks should be the minimum number to build up and maintain growth for the period of rationing. Spelling of these paddocks should be started now before growth slows up. Allowance should also be made for earlier supplementary feeding. This should be possible following a good season for hay, ensilage, and root crops in most districts. Timely culling of low-producing cows may be a factor in lessening the risk of overstocking during winter.

Electric fences have come into favour in some localities for subdivision of paddocks to be fed off in breaks. A single-wire fence with a few standards is sufficient and is easily moved across for the next break. The cows will graze the fresh feed in preference to that in the adjoining grazed breaks.

Method of Rationing

Rationing is usually carried out immediately after milking, the herd being on the new break for half an hour or longer before being put on to normal grazing. When the rationed grazing is completed harrowing and further spelling follow while the next rationed paddock is being grazed. The system is continued until rationing is no longer necessary. August and September are usually critical months, particularly in cold weather, and such grass is then invaluable in maintaining the milk flow and the condition of the herd.

As night paddocks should become the strongest ryegrass areas on the farm under reasonable treatment, they could be made to produce good feed during the August-September period. Night paddocks become very dirty after about a fortnight's grazing, but if they are then given a good harrowing and are spelled for a period, they should throw strong feed. A second night paddock could then be similarly treated.

◆

Handling the Potato Crop

THE main potato crops in the South Island are now being lifted. Late blight was widespread towards the end of this season, and many crops were dug earlier than was anticipated.

The bulk of supplies of table potatoes for New Zealand's domestic requirements and a proportion for export to the Armed Forces during the winter and early spring are obtained from the South Island. From this source also comes the main supply of seed for next season's plantings. Unfortunately, heavy losses occur annually, largely through rough handling, which results in much rot during storage.

Dry rot is the chief cause of most storage losses, and small injuries and bruises incurred during harvesting and transport are the ideal places of entry for this widespread disease. Varieties with tender skins, or crops dug on the early side before the skins have hardened, are very prone to infection, as they are easily injured. Any measures which avoid injury before storage will therefore largely minimise losses.

The following is the sequence of operations in which injury is likely to occur.

Damage in Harvesting

The potato digger may be set at too shallow a draft or driven too fast to shake off dirt without sufficient regard to damage. This machine is far from perfect, and some growers utilise old motor-car tubes on it to cushion the fall of the tubers. Under dry conditions the second apron should be taken off. Another point to be watched by the grower is rough handling into the buckets when picking up the tubers. Neither mutilated and diseased potatoes nor dirt should be included.

With the mechanical grader, damage is reduced if a minimum effective speed is maintained and the machine kept full. Extra care in the removal of the remainder of the injured and damaged tubers is warranted.

Damage in Transport

Rolling and dumping of the heavy sacks and the use of hooks by carriers is difficult to overcome; possibly a more general use of crates, at least for seed, is the solution. Iron railway wagons are most unsuitable for the transport of potatoes as they promote rapid infection and spread of rots due to sweating.

Storage of Potatoes

Many lines shipped to the North Island and stored under more humid atmospheric conditions may deteriorate rapidly. As far as possible storage conditions should be cool, well ventilated, and dry. If potatoes are left in the sacks, they will soon require picking over, and as the season advances long, spindly sprouts may develop. Seed potatoes pitted in the south over the winter should be well protected. Baled hay round the clamps is a good safeguard, while provision for ventilation at the top is required. Periodical inspection for diseased tubers is necessary if losses are to be kept down to a minimum.

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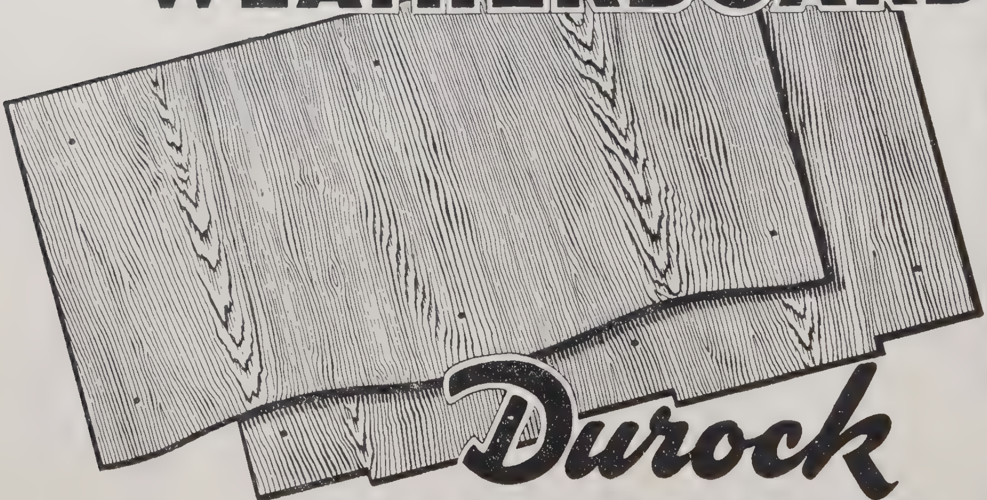

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Treatment of Young Pastures

THE season has been excellent for the early sowing of new pasture, and provided a good strike of grass and clover has been obtained, success in establishment will now depend mainly on good grazing management. Great care must be taken with the newly-sown permanent pastures, and they must not be made to act as supplementary feed at the expense of successful establishment of any of the pasture constituents.

Ryegrass Establishes Readily

The ryegrasses are rapid in establishment under a wide range of conditions. Other grasses such as cocksfoot and dogstail are less adaptable, and late sowings containing these grasses and red clover are frequently failures. Under average conditions ryegrass will be through the ground in a week, and cocksfoot and dogstail in about a fortnight. Under adverse conditions ryegrass has the best chance of establishment, although a check during early development will reduce vigour. Early-sown pasture will be making good growth during the early winter, but late-sown pastures will be slower establishing, require more careful handling, and yield less winter feed. Clovers may not establish well when sowing is delayed and there is a greater risk of poaching the ground with stock.

Stocking the New Pastures

Light stock such as sheep are preferable for the first grazing of the new pasture. High per-acre stocking over shorter grazing periods should be adopted. This will bring about evenness of grazing without selective effect and a good, even hoof consolidation. Firmness of the ground is essential to pasture vigour and the carrying of heavier stock. The stock nitrogen will then act as a useful and even topdressing when the pastures are grazed in this way. An application of superphosphate in the early spring will further assist young plants, particularly clovers.

Overgrazing and Undergrazing

Young pastures should not be grazed too closely in winter, as recovery is unduly delayed and the action of frost and rain is detrimental on ground with a depleted grass and clover cover. Any persistent close grazing will reduce root development and plant vigour. On the other hand, undergrazing of young pasture is a common fault and equally undesirable. It is most harmful when Italian ryegrass has been included in the seed mixture due to the strong shading of the slower and more permanent species of a mixed pasture sowing. Rank growth between grazings, while not usual under sheep grazing, is more likely to occur on the dairy farm. Under most conditions a March sowing should provide at least three grazings before September. Every endeavour should be made by careful grazing control to promote a dense and vigorous sward, able to withstand winter conditions. Such a pasture will yield well and maintain the balance between grass and clover.

Weeds give least trouble in autumn-sown pastures. Most pasture sowings contain a good proportion of ryegrass which will smother most annual and perennial weeds that are attempting to establish at the same time as the ryegrass. Most aggressive perennial weeds are more or less dormant in the late autumn-winter period. In control of perennial weeds, such as fern, blackberry, and ragwort, the aim is to establish a good cover over the winter and have sufficient growth to maintain heavy stocking when the weeds are most vulnerable. The young fronds of fern and young tender shoots of blackberry require this treatment as they appear in spring. Young ragwort is eaten by sheep but not by cattle.

Summer annuals are of little moment in the new autumn-sown pastures, but may establish in the spring if the ground has been badly poached during the winter by grazing when the ground was wet and soft.

Weeds such as docks and ox-eye daisy, which are slow to establish from seed, have a better chance of establishing in the autumn-sown pastures. Competition at this time is less keen than it would be with a spring sowing.

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Harrowing of Pastures

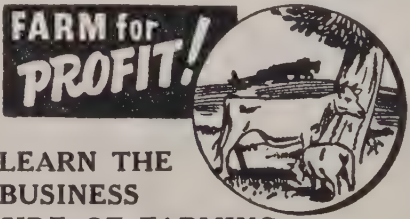
THE regular harrowing of pastures to spread stock droppings is one of the principal operations at this season on a dairy farm. The up-to-date dairy farmer rightly classes this work as essential from the point of view of fertility, productiveness of pastures, and health of both plants and animals.

Harrowing is of greatest value from the start of autumn growth right through to the spring. Early harrowing is especially valuable, as it enables the pastures to make full use of the natural fertiliser before winter slows up growth. In many cases harrowing is urgently needed now. A herd of 20 cows each year drop fertilising material approximately equivalent to 6 tons of sulphate of ammonia, 1½ tons of superphosphate, and 3 tons of sulphate of potash. If undisturbed, the summer accumulation of dung destroys the grass beneath, while rank growth neglected by stock encircles the droppings. Yorkshire fog, which is a winter-growing grass, frequently develops in this way, while weeds rapidly occupy bare ground as the droppings decay.

Unevenness in the pasture will be accentuated in the spring, while the rough unpalatable grasses will prove difficult to control by grazing alone and are liable to harbour pests.

Harrowing is most effective following any concentration of stock on the pastures, as is the case with high per-acre stocking or with winter supplementary feeding. Distribution by harrowing becomes a definite and a cheap topdressing.

Harrows used should be of a type that will disintegrate the droppings. Tripod harrows follow unevenness in the ground. Light tine and chain



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harrow combinations are popular. The tine harrows are frequently used in the inverted position.

Harrowing as grass cultivation is an entirely different proposition. Any tearing action on a good sward is liable to open the pasture to weed invasion and has a weakening effect on most of the useful grasses which are shallow rooted. A ryegrass-clover pasture requires rather the consolidation of hoof cultivation. Drastic harrowing has a place in opening up a sod-bound pasture, perhaps with a view to surface sowing of seed on the existing sward at a seasonable time of the year.

Moss is more of an indication of low fertility than anything else—a condition which harrowing alone cannot rectify.

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Care of Young Stock

WINTER is the most trying period for all young stock, and unless particular care is taken their future production may be seriously impaired.

Calves

The average dairy farmer is often more solicitous towards the stock which are in production, to the detriment of the younger animals. There is an old saying that "feeding is half the breeding," and if this is so it would be preferable to pay as much, if not more, attention to young stock than mature animals. During the first winter calves should be the first stock on the dairy farm to be given small rations of hay and roots. This will accustom them to supplementary feeds which they will have to consume in larger quantities as grass growth falls away. Some time elapses before young stock acquire a taste for feed other than grass. If this feeding is delayed unduly, digestive troubles are more likely to result. Any tendency for the growing animals to receive a check which may undermine constitution will also lower their resistance to disease.

Impure drinking water is a common source of disease and young stock should therefore be provided with a good, clean water supply. In colder climates lack of reasonable shelter for the young stock also reduces vitality.

Hoggets

Dry country lying to the sun is the most suitable for wintering hoggets, while frequent changes to fresh, clean pasture are desirable. The general opinion among sheep farmers is that heavy set stocking with hoggets is injudicious.

To have the country in good order for hoggets thorough grazing by cattle is usually the first requirement. Pastures are subsequently kept short and free of roughage with an adequate number of cattle grazing with the hoggets.

In feeding supplementary fodders, too sudden a change in diet is detrimental, and watery feeds such as roots require supplementing with hay. Full use should be made of a suitable run-off to pasture.

Grazing on turnips and swedes is difficult due to tender gums when hoggets are about a year old. Where these crops are grown, the hoggets should consume the tops on each break and should be the first stock to be put on the crop. If they commence the winter in the best possible condition and special attention is then paid to their feeding requirements, there should be little risk of a check in the development of carcass or wool. If in poor condition by spring, they are more susceptible to infestation of internal parasites and digestive troubles which cause scouring.

—*E. M. BATES, Instructor in Agriculture, Alexandra.*

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Advice to farmers for top-dressing, drenches, and licks to prevent cobalt deficiency in sheep and cattle is contained in Bulletin No. 180, which is available free from offices of the Department of Agriculture.

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ORCHARD AND VINEYARD

Work for May

THE principal work in the orchard from now until the end of the fruit season will be the harvesting and storing of apples and pears. There will still be considerable quantities of late apples to harvest, a large portion of which will be packed for cool storage, and some will be held in orchard storage. A good deal of care should be exercised in the handling of fruit intended either for cool storage or orchard storage, in order to reduce to a minimum the possibility of wastage. All damaged fruit should be discarded, any with stem punctures being rejected, especially in seasons like the present one, where rots are developing so readily. All fruit held in orchard storage should be inspected regularly, and no time should be lost in marketing it where rot or wilt is in evidence. As ripe-spot usually makes an appearance during late April or early May, varieties susceptible to this trouble should be harvested and disposed of before the spot develops. As Sturmers bruise so readily, particularly in wet seasons, the fruit should be picked and stacked in the shed for at least 2 or 3 days prior to grading and packing, as this practice will avoid many of the minor bruises incidental to handling.

Late Spraying

With the close of the harvesting season consideration should be given to the spraying of stone-fruit for the control of leaf-curl, brown-rot, and die-back. Bordeaux mixture 5-4-50 at leaf fall, followed by a second application of the same strength at bud-movement in the early spring, has proved most effective, and stone-fruit growers would be well advised to carry out this programme. When autumn spraying has been completed the spray plant should be thoroughly cleaned out and overhauled. Pipelines on stationary plants should be flushed out and then filled with clean water.

Drainage

During the autumn orchardists should give attention to their drainage system, in order to obtain the maximum tree development and production. It is well known that fruit trees suffer very severely if the drainage is inadequate to take away surface water. Where necessary new lateral drains should be dug. All existing open drains should be thoroughly cleaned out, and deepened where necessary, so that any surplus water can be carried away freely.

Ploughing and Manuring

Where cover crops are not being grown deep ploughing at least once a year is advisable, and to obtain the best results this work should be done in the late autumn. The effect of autumn ploughing is to improve the physical condition of the soil through the action of rain and frost, making it more friable. On heavy land and clay soils it is desirable to get a good tilth in the early spring, and this can be attained only by winter ploughing. Although it is advisable to plough as deeply as possible in the autumn, care should be taken not to injure any of the main roots of the trees. Therefore, the deepest furrows should be made in the centre of the rows, and these should be gradually reduced towards the trees.

In these times of restricted fertilisers the best use should be made of the materials available. Where phosphatic and potassic manures are applied the sowing should be done immediately prior to the deepest ploughing. In order to obtain the best results, nitrogenous fertilisers should not be applied until the spring, when growth has commenced.

Shelter Belts

Where shelter belts have become too high, excluding air and light and also becoming a danger through breakages, they should be judiciously topped. The roots from some varieties of shelter trees, particularly *pinus insignis*, will often encroach too far into the orchard, with a bad effect on growth and production of trees in the second and on occasions the third row from the shelter belt. This extension of roots can be checked by digging a trench from 3ft. to 4ft. deep and about 4ft. from the shelter trees.

New Plantings, Replacements

Where it is necessary to fill gaps in the orchard new trees should be ordered from the nursery as soon as possible, and when received they should be heeled in in readiness for planting when soil conditions are suitable. Planting should on no account be undertaken when the soil is wet. Land intended for new plantings should be thoroughly prepared and brought into good tilth, and particular attention should be given to drainage. It has frequently been found that the development of trees which have been growing for several years has been very poor, and in many cases this is due to inadequate drainage.

—D. J. HOGG, *Orchard Instructor, Mapua.*

Citrus Notes

Seasonal Diseases and Drainage

BROWN-ROT (*Pythiacystis citrophthora*) may cause extensive rotting of fruit and defoliation of citrus trees, and is troublesome during the winter and early spring. Infection is spread from the ground to the lower branches, mainly by rain splashes, and in wet weather the disease may spread rapidly throughout the tree.

Control is readily obtained by removing all branches within 18in. of the ground, and spraying the tree thoroughly with Bordeaux mixture 3-4-50. Tall weed growth under the spread of trees, which encourages the development of the disease by preventing the drying of the soil surface, should be suppressed.

In most citrus areas the disease does not become troublesome before early June, consequently the first preventive spray should be applied during the last week in May or early June. Orchards subject to infection earlier in the season should have the spraying date advanced accordingly. A second application about four or five weeks later is necessary in some localities, especially in wet seasons. Summer-oil at a dilution of 1½ or 2 per cent. should be added to this spray where previous sprays have not given a satisfactory control of hard wax scale. While the oil serves as a valuable insecticide, it should be used in combination with Bordeaux mixture only when necessary, because of the difficulty in removing the spray residue from the fruit.

Citrus-blast

Citrus-blast (*Pseudomonas syringae*) is a bacterial disease present in the main citrus-growing areas, and is most troublesome in exposed orchards where leaves, fruit, tender shoot growth, and even small branches may be attacked. The disease is active principally in late winter and early spring, the lemon being most susceptible to attack, while the sweet orange appears to be highly resistant.

Citrus-blast on leaves causes irregular, blackened areas, mainly along the veins and mid-rib, and generally commences at an injury. Firm, black, circular, sunken areas are caused on fruit. Tender shoot growth often becomes infected when from 3 to 6in. long, and the entire shoot may be killed. The disease is most active following a sharp frost, and the killing of small branches up to about the thickness of a lead pencil is not uncommon in the colder citrus areas, but such injury is principally confined to the lemon and is readily recognised by conspicuous longitudinal deep cracks in the bark. Control measures consist of spraying the trees thoroughly with Bordeaux mixture 3-4-50 about three weeks before infection is likely to appear, and removing and burning all infected material. In areas where sharp frosts can be expected early in the winter the spray should be applied earlier than in areas that are almost frost free.

Drainage

To maintain citrus trees in a healthy condition it is imperative that the normal soil water level be kept about 3ft. or more below the surface. During the early establishment of the grove the trees may thrive despite the higher water-table, and this may create the belief that good drainage to a depth of 3ft. is not essential; however, as the trees mature the roots penetrate to a greater depth, making drainage essential to the depth indicated. Special attention should be given to early drainage of the heavier types of clay soil. If this is delayed until the trees commence to assume an unhealthy appearance, it may take several years at least to restore the tree to full vigour.

Seasonal Reminders

Good drainage to a depth of 3ft. is essential for all mature citrus trees.

Spray for citrus brown-rot and citrus-blast before the diseases appear.

Monthly picking of lemons assists in securing a heavy setting of young fruits.

There is yet time to sow a green crop outside the orchard for mulching around the trees before the dry summer period.

Dicky-rice Weevil

The injury caused by dicky-rice weevil is not confined to citrus fruit, for leaves also are subject to extensive injury, which can seriously check the vigour of trees. The pest continues to be active throughout the winter and early spring, and therefore during this period the tangle-foot bands should still be kept in a fresh condition, and weed growth under the spread of trees should be kept clear of branches which may be weighed down by fruit.

—*P. EVERETT, Orchard Instructor, Kaikohe.*

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Measurement Tables.

Units of measurement may be converted by the following simple table:

Ins. to cms.	**Multiply by**	**2.540**
Yds. to metres	,,	**.900**
Miles to kilometres	,,	**1.600**
Sq. ins. to sq. cms.	,,	**6.450**
Cub. ins. to cub. cms.	,,	**16.400**
Grains to grams	,,	**.065**
Lb. to kilograms	,,	**.450**
Cub. ft. to cub. metres	,,	**.030**
Cub. yds. to cub. metres	,,	**.760**
Cms. to ins.	,,	**.400**
Metres to yds.	,,	**1.100**
Kilometres to miles	,,	**.620**
Sq. cms. to sq. ins.	,,	**.155**
Cub. cms. to cub. ins.	,,	**.060**
Grams to grains	,,	**15.400**
Kilograms to lb.	,,	**2.200**
Cub. metres to cub. ft.	,,	**35.300**
Cub. metres to cub. yds.	,,	**1.310**

One cord of firewood measures 128 cub. ft. and is generally placed in a stack 8 ft. long by 4 ft. wide by 4 ft. high.

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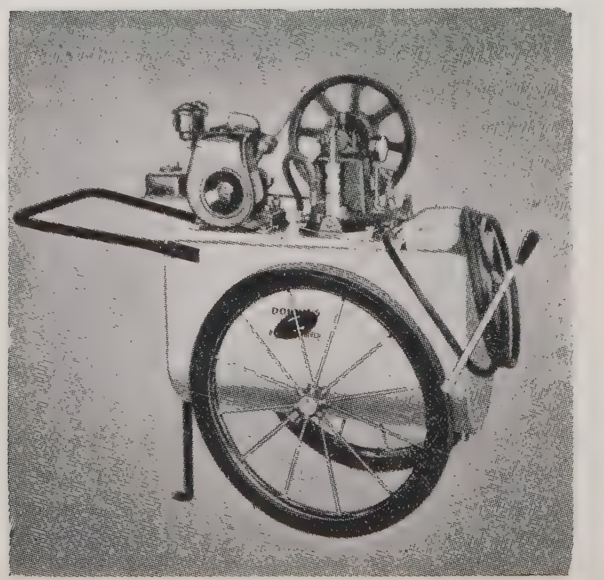

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Clearing Up the Garden For Winter

MAY, together with the two following months, is usually considered a "dead" period for vegetable-growing in the home garden. Still, the gardener who understands what is necessary for future success will always find plenty of work even during winter to keep him usefully employed when there is time to spare for the home garden.

Live hedges require trimming, and when this is being done the inexcusable habit of burning the trimmings should not be perpetuated. The green, succulent tops of most live hedges will make an excellent contribution to the garden compost heap. If there is no compost heap being made, these green cuttings can be dug into any vacant part of the garden when the soil is being turned over. Should it not be practicable to dispose of them in this way, they should be laid close into the roots of the hedge from which they were taken. In this position they will decompose, and ultimately the plant food which they contained will be returned to the soil to reinvigorate the hedge plants. The application of manure or fertilisers to stimulate the growth of live hedges is quite unnecessary if the trimmings are utilised in the manner just recommended.

DON'TS

DON'T be hypercritical when some recommendation may be made which, perhaps, does not exactly agree in detail with what has been previously stated. Remember, electric light has largely superseded the candle—science, as well as time, marches on.

DON'T neglect stored potatoes. These should be regularly examined and disease-affected tubers removed. The same remark applies to the inspection of carrots and the removal of diseased roots.

DON'T fail regularly to inspect all stored gourds. It has been stated that it is an advantage to change their position periodically.

DON'T fail to make provision for sterilising at least sufficient soil in which to grow vegetable seedlings for next season. When the soil has been treated protect it against re-infestation.

As it is becoming more generally known that many of the ordinary garden weeds are host plants for injurious fungi and insect pests which attack the edible garden vegetables, time can be usefully spent in digging into the garden soil all but those which are perennial. Perennials should be removed and burnt.

In removing weeds which may be growing close to perennial crops, such as rhubarb or asparagus, care should be exercised in digging, as particularly in rhubarb, there is considerable root growth near the surface, and deep digging will be most injurious to future production. It should be noted, too, that weeds permitted to grow around rhubarb crowns rob the plants of the nutrients necessary for the following crop.

The latter remark applies also to asparagus. Careless digging around the crowns may substantially injure dormant buds which will produce next season's spears. Provided the top growth has completely changed to a brown colour and become hard and is withering, there is no advantage in retaining it on the plants. It should be cut down, burnt, and the ashes broadcast over the bed.

Tomatoes

Vines which have finished bearing should be cut from the stakes and taken out. In the home garden these plants should not on any account be pulled out; they should be **dug** out, hung up somewhere to dry thoroughly, and then destroyed by burning. This is almost the only safe method of preventing the spread in the soil of many of the injurious fungi and other soil diseases which attack the tomato plant.

Should the vines still be bearing matured green tomatoes, many may be ripened by cutting the plants a few inches above ground and hanging them where normal temperatures obtain and where they will be protected from frosts. For this purpose a small glasshouse is invaluable. The remarks concerning diseased vines apply equally to diseased fruits, which are best destroyed by burning. It will be difficult to burn them on an ordinary fire in the home garden, but an incinerator could be used to advantage.

When the area which was occupied by the tomato crop has been dug over the garden plan for next season should be consulted to determine the variety of green manure crop which may be considered best to grow to suit the next vegetable crop.

If an early crop is to be raised, oats, mustard, and cress may be grown. These varieties are quick growing, and in a short time will provide substantial green growth which, when dug in, will decompose quickly and assist in the maintenance of soil fertility.

If, however, the intention is to grow a main crop on the area on which the tomatoes had been grown, it may be an advantage to sow lupin seed. The green crop secured will be a good one for digging in, but the principal advantage will lie in the enrichment of the soil through the nitrogen which has been collected by the roots of the plants. This will be at its maximum as the lupins reach maturity.

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Carrots

The carrot bed should be kept under regular observation for indications of the presence of the carrot rust-fly. The surest external sign of the presence of this most destructive pest is the changing colour of the carrot foliage to that somewhat resembling a badly burnt brick—a sort of bluish-rusty colour. If only a few leaves are affected, these can usually be traced to one root, which should be instantly removed and the surrounding area given an application of horticultural naphthalene; indeed, it would be better to give the whole bed a dressing of this disinfectant. Naphthalene will not destroy the carrot rust-fly, but will have the effect of preventing breeding in the area to which it is applied.

Lettuce

To those who have to depend on continual supplies of this salad vegetable, seedlings should always be planted out on a raised bed during late autumn and winter. Cold, wet conditions will not permit of necessary development to form good hearted plants. A raised bed, a well-sheltered situation, and a light, rich, friable soil are the desirable conditions for the production of lettuce during what may be termed the "off" season.

Spinach

As soon as cold weather sets in, spinach will not grow satisfactorily unless it receives good attention. The best and quickest stimulant for spinach is nitrate of soda, applied as liquid manure and made by dissolving 1oz. to 4 gallons of water. According to the condition of the plants, it may be applied weekly.

Cauliflower

Cauliflowers should now be all harvested and the vacant ground turned over and sown to a green manure crop. Should there be a few plants still remaining, their main leaves can be loosely tied together at the top to protect the curds from frost.

Broccoli

Broccoli will follow the cauliflower with a supply of curds. During cold, wet conditions the plants will not show much development above normal, but it is not a good cultural practice to use highly nitrogenous fertilisers in an endeavour to force their growth. Provided the condition of the soil was right and the proper fertiliser applied before setting the plants, maturity should be reached without undue delay. In areas where heavy frosts occur it is advisable to tie the outside leaves, as has been recommended for cauliflower.

Cabbage (Savoy)

Omega is the variety of Savoy cabbage which at present will be growing in the garden. Should the plants be showing signs of lack of normal growth, blood and bone manure, a good tablespoonful to each plant, may be applied and worked into the soil. The same recommendation concerning the use of nitrogenous fertilisers as that given for broccoli applies equally to Savoy cabbage during winter.

Cabbage (Spring)

Cabbage plants for early spring cutting will require special attention during May to induce the growth necessary to carry them successfully through the severe winter weather ahead. Flower of Spring, the variety recommended in the "Journal," will stand cold weather and be harvested in early spring, but the soil conditions and the cultural practices adopted must be the best that can be provided. Weekly applications to each plant of just a pinch of nitrate of soda, which should be mixed with the soil at once, will do much to ensure the necessary development. The additional labour expended on this crop will be amply repaid by the supply of cabbages during early spring, when, usually, green vegetables are in short supply.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Removing Shaws From Blighted Potatoes

THE prevalence of potato blight this season has prompted inquiries as to the value or otherwise of the practice of removing the shaws from affected crops. The Seed Certification Officer of the Department of Agriculture has supplied the following information:—

The removal of the shaws from potatoes in order to prevent the spread of potato blight into the tubers has been reported upon in various overseas publications. These reports suggest that the removal of the shaws is a considerable advantage in preventing the spread of late blight, particularly when the tubers are already well developed. So far as is known no trials of this treatment have been carried out in New Zealand, and it is therefore impossible to say at first hand just what value results from this treatment.

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NOTES FOR BEEKEEPERS

Preparations for Wintering Colonies

THE harvesting of all surplus honey should have been completed by now, and extracting supers will be in the shed awaiting correct storage to prevent loss of combs by the depredations of the wax-moth grub. This matter will be fully dealt with in next month's notes; at the present time the beekeeper will require to see that his colonies are wintered down correctly, particular attention being given to the following points:—

Minimum of Manipulation

Cessation of nectar flow in the late summer, when colonies are generally strong, leaves a large force of worker bees with nothing to do but cause trouble should the beekeeper give them a chance. Until these surplus field bees die off they are very quick to attack and rob out any weak colonies. Therefore do not put out any wet combs at this period to be cleaned up, and refrain from disturbing colonies more than is absolutely necessary.

Young Queens

Prolific queens which have built up the strength of colonies in the early spring and maintained brood rearing at a high rate during the early part of the main honey flow generally slow up just at a period when a force of young bees is desirable to form the winter cluster. To overcome this the autumn requeening of each colony is recommended. The introduction of a ripe queen cell, after the old queen has been destroyed, towards the end of the main honey flow, ensures a young queen for next season, and one that will start sufficient brood to give an ample supply of young bees for the winter cluster. Colonies which face the winter with a cluster of comparatively old field bees invariably come out in the spring very weak, if they have not died or been robbed out before the spring.

To appreciate the necessity of stocking up the hive with young bees in preference to leaving the old field bees to take care of the colony one needs to understand the quiescent state into which bees enter when wintering conditions are ideal. Bees remain in quietest condition when the outside temperature is round about 57° F. If the thermometer goes below this, the bees, instead of quietly clustering, become active and gradually bring up the inside temperature of the hive. This is brought about by the movement of the bees on the inside of the cluster and the interchanging of places with bees from the outside. The consumption of honey within easy reach is also used to create extra heat. Following very cold spells which have lasted for several weeks, hives may be found in the spring with all the bees dead, but still having ample stores untouched. This is because all the honey in close proximity to the cluster has been used up in an endeavour to maintain life, and the low temperature has chilled any bees that attempted to bring over supplies from an adjacent comb. One or two days of warmer weather would have been sufficient for the cluster to open up and fresh supplies of honey to be brought within easy reach.

Temperatures above 57° F. are responsible for the breaking up of the cluster and increased activity of the bees due to warmer conditions. In some instances the queen may be induced to lay. Under such conditions normal stores soon become depleted.

Ample Good-quality Stores

The amount of honey left as stores will have been adjusted when the last lot of honey was taken in for extraction. Capped combs which mean well-ripened honey should be left in the hives in preference to a large amount of uncapped honey. Pollen is essential for the production of young bees, so the hives should not be depleted of their pollen supplies. This reserve may come in very useful in the spring should unfavourable weather be experienced when the first pollen-producing flowers come into bloom.

Shelter

This has a bearing on successful wintering, as it controls to a limited degree some of the above conditions just explained regarding the bee cluster. Much bee-keeping literature in the past has stressed the necessity for the provision of adequate shelter for the bees, and urged the planting of certain live hedges. As the years pass by this shelter can become a definite drawback. Too much shelter during the winter months is inclined to keep the hives damp for long periods, thus not only shortening the life of hive equipment, but providing conditions under which the bees do not winter well. Excessive shelter, even with dry conditions, is still not ideal for wintering, as on sunny days the increased heat causes too much bee activity and the consumption of additional stores. In the spring warm, sheltered apiaries are ideal for working in, but too often considerable trouble is experienced in keeping down excessive swarming. Colonies in these positions build up too rapidly in the early spring and are very often past their peak when the main honey flow commences. Absolute lack of shelter, with the hives exposed to continuous cold winds, is not conducive to successful wintering. Conditions half way between these extremes are desirable, and can be obtained by careful selection of the apiary site to take advantage of the natural lay of the ground and to secure maximum sunshine with protection from prevailing winds, but at the same time allowing a free flow of air around the hives. This is sometimes referred to as "air drainage." Where a break-wind is desirable the most suitable type is to erect a fence about 6ft. high of slabs or 8in. x 1in. boards spaced about 2in. apart. This will break the main force of the wind and allow the necessary free circulation of air.

Sound Equipment

All hive equipment should be checked over, special attention being given to the condition of the hive covers; faulty ones should be replaced and renovated during the winter months. Hive entrances should be reduced to check robbing and prevent the ingress of mice. If time and labour are available, each hive should be moved and the site cleared of all long grass or weeds before replacing the hive. This will encourage air circulation under the floor boards, which will last much longer.

Apiary Fences

During the winter the minimum number of visits are made to out apiaries, so that it is very necessary to see that all fences are in a sound condition. During this period stock are fossicking round for any fresh feed, and fences need to be well strained to keep animals out of the apiary.

Conclusion

The following summarises the main points in preparing bees for the winter:—

(a) **Have a young queen in each hive to provide an ample force of young bees.**

(b) **Sufficient stores of good quality.**

(c) **Suitable shelter.**

(d) **Sound equipment.**

(e) **Protection from stock**

Attention to the successful wintering of all colonies will determine to a very large extent the crop secured next season.

—*C. R. PATERSON, Apiary Instructor, Hamilton.*

* * *

POULTRY KEEPING

Dominion Poultry Conference

REFERENCE to the present food shortage and to post-war organisation and marketing, and to the fact that the poultry industry was facing a crisis, was made by Mr. Ross Fraser, Acting Director of the Internal Marketing Division, in his address when opening the Annual Dominion Poultry Conference on behalf of the Minister of Agriculture, Mr. B. Roberts.

The Food Shortage

The present and probable future position of poultry food supplies for the industry was set out by the Wheat and Flour Controller, Mr. R. McPherson. It was anticipated that the total quantity of pollard and bran manufactured in the Dominion would be 50,000 tons, a somewhat reduced quantity as against the previous year. Supplies of stockmeal (wheatmeal) from Australia had ceased—undoubtedly a serious blow to poultry-farmers in the North Island. With the floods in South Canterbury and the then uncertainty regarding supplies from overseas it was not possible for Mr. McPherson to be re-assuring on the adequacy of wheat supplies. In the subsequent discussion delegates left the Wheat and Flour Controller in no doubt as to the difficulties experienced by poultry producers at the present time. They were generally agreed that many of their difficulties arose from the present maldistribution of available supplies of wheat, bran, and pollard, and strongly urged that steps should be taken to strengthen the position of the Poultry Food Distribution Committees recently set up in the more important centres throughout the Dominion.

Poultry farmers will learn with satisfaction of action since the conference. The Wheaten Stock Foods Control Notice 1945, gazetted last month, has been the result of approach by the New Zealand Poultry Board to the Minister of Industries and Commerce, following the Dominion Conference. This Order should go far to ensure that the available supplies of wheat, pollard, and bran go first to poultry-farmers, who are so dependent upon these foodstuffs. The Order reserves all supplies of wheat and wheat by-products for the poultry industry unless specifically released by the Wheat and Flour Controller for other purposes. **Registered poultry keepers'** requirements are to be given first consideration; a considerable proportion of the total pollard and bran manufactured is to be set aside for their use before any distribution is made to other poultry-keepers and other classes of livestock. Thus full recognition is given to the need for safeguarding the flocks of commercial poultry-farmers. On the other hand the small or backyard poultry-keeper has not been overlooked, as this class of poultry-keeper is first on the list of priorities in the distribution of pollard and bran after the commercial producers have received a fair proportion of the foods available. This proposition will vary according to the amounts of pollard and bran manufactured during the year and the supplies of wheat which become available for stock-feeding purposes.

Thus the commercial poultry-farmers have been granted much of what they requested at their conference; it is now up to them to show their appreciation by limiting their flocks to only healthy and productive stock. There is still no room for waste.

Unfortunately, owing to circumstances unforeseen during conference week, the amounts of pollard and bran to be manufactured will be less than the figure of 50,000 tons mentioned. **The present position in regard to wheat supplies, however, is satisfactory.** The crisis mentioned by Mr. Fraser will be faced and overcome.

Post-war Marketing

Members of the New Zealand Poultry Board made it clear that they were unable with the time at their disposal to attend satisfactorily to the many problems of production and marketing at their monthly meetings. Realising the great importance of the present and post-war marketing of eggs, the board asked conference to consider the possibilities of setting up an entirely new body of producers charged solely with studying the marketing of eggs and working in close co-operation with the Internal Marketing Division. The poultry industry is growing rapidly and the conference has recommended the setting up of an Egg Marketing Council. A delegation from the Poultry Board met the Minister of Marketing early in March to discuss the possibilities and desirability of setting up such a council.

Egg Quality

The quality of eggs sold to the public was discussed at the conference, and it was the unanimous opinion of delegates that quality in eggs must receive greater attention in the future. Sales of eggs in the future, when supplies equal, if not exceed, demand, will be affected as much by the quality as by the size of eggs. Unless this fact is fully recognised by all producers, it will be difficult to lift the consumption of eggs per head of population to a level satisfactory to the industry. Lack of egg quality can be a most complex problem. All large egg-producing countries have met serious difficulties in this direction, and certain aspects of this problem have yet to be solved in some of these countries. Delegates at the conference mentioned some of the factors directly influencing egg quality, such as delays in handling the eggs during marketing, the use of egg-washing machines, the poor handling of eggs on the farm, but no reference was made to the influence of the stock upon egg quality. This is an aspect which must be realised and studied. Stock of poor constitution, particularly during the flush season, not only give poor-shelled eggs, which will influence the keeping quality, but also produce eggs with poor-quality whites. Eggs having weak or watery whites have caused considerable trouble in the United Kingdom and are undoubtedly a factor affecting eggs in this country. It is hoped by arranging for close co-operation between egg floors and Poultry Instructors of the Department of Agriculture that assistance may be given producers who are consistently marketing eggs of a low quality. The problem is certainly one involving factors of both marketing and production.

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Chick-Sexing Exams.

WITH the object of assisting prospective chick-sexers the Department of Agriculture is arranging to hold examinations for the Department's chick-sexing certificate during:

(a) The third week of May;
(b) The third week of August;
(c) The last week of October.

The precise days and times will be fixed later, and applicants sitting for these examinations will be notified. Any person wishing to sit at any of these examinations is requested to notify the Department of Agriculture, Box 3004, Wellington, not later than one month prior to the approximate dates given above. Full details regarding the conditions under which these examinations will be conducted may be obtained on application to the Department.

These examinations will be held in Wellington, unless sufficient applications are received from other main centres to warrant an examination being conducted at any one of these other centres, i.e., Auckland, Christchurch, or Dunedin.

YOUNG FARMERS' CLUBS

The Importance of Young Farmers' Clubs

This article by Mr. Ivan Tabor, chairman of the Whakarongo Young Farmers' Club, is based on his recent radio talk in the weekly session from Station 2ZA, Palmerston North.

MY object in writing this is to endeavour to stress the importance of the Young Farmers' Clubs movement in the future well-being of the farming industry in New Zealand, and also the duty of clubs to the rehabilitated soldier on the land.

Drift to Towns

Among the foremost of the objects in the constitution of the Young Farmers' Clubs organisation is "To promote among young farmers interest in the well-being and advancement of farming in New Zealand." This clause cannot be too strongly emphasised when we consider the alarming drift of the farming population to the town areas in the past 25 years. Statistics show that for every 27 families at present engaged in farming, 63 families live in the urban areas, while earlier in the century the figures were reversed. This is reason enough why we should take notice; but there is still another example to consider. The total area of New Zealand is 66 million acres; 4 million acres is classed as totally unproductive, leaving over 60 million acres for primary production. Of this 60 million acres approximately 60 per cent. is represented by holdings of 5000 acres and upwards, while only 14 per cent. is represented by areas under the 1000-acre mark. These figures demonstrate the dire necessity of reviving the rapidly-dying interest in the land.

Another factor contributing to this loss of interest is that the man on the land has been judged for quite a while as a person of only average ability. How often do we come across the following: A man brings his three sons before him and says, "Jim, you've matriculated—we'll make a doctor of you. Bob, you're also quite brainy—you'll make a good lawyer. As for you, Dave, you're the dud of the family—we'll make a farmer of **you**!" People fail to realise that the farmer is a man needing brains and application equal to what is required in any other sphere of employment. He is a man running a highly intricate business, which calls for a power of concentration often far ahead of that needed for the majority of other trades and professions.

The figures of 27 families on the farm to 63 families in towns and cities represent a ratio of about 1 to 3. The population of New Zealand being 1,600,000, the farming industry is represented by a little over ½ million. In this ½ million there are over 50,000 young men between the ages of 14 and 30 years—that is, young men eligible for Young Farmers' Clubs membership. With a prospective membership of, say, only half that number, the Young Farmers' Clubs movement stands as a strong organisation made up from the generation vitally concerned not only with farming problems, but with national problems as well. It is our duty as an organisation to endeavour to instil the interest necessary to enable these problems to be solved.

This interest can and must be encouraged by the efforts of the clubs and the members themselves. The advantages and privileges of rural life must be brought forward so that they can be assimilated and acted upon. A great deal can be done through lectures, demonstrations, and field days, introducing at the same time new discoveries and up-to-date farming methods. It's up to us young farmers to set about instilling the interest so necessary to arrest the decline of our industry.

Rehabilitating Servicemen

In introducing the problem of the rehabilitated soldier I am voicing the thoughts of the majority of people today. A big task lies before us to see that these men are settled securely in various forms of employment. In playing our own part we must realise that no effort should be spared, as these were the men who left our shores prepared to give everything that we might be saved from tyranny and oppression. These men on their return will be experienced soldiers, men who have travelled and seen the greater part of the world. But what do the majority of them know of a civil occupation? Many of them were only just of overseas military age when they went away, and their experience in civil occupation was, in a large percentage of cases, a maximum of only two years—hardly time to learn the fundamentals of employment. And what of the young soldier entering camp at 18 years of age, and proceeding overseas on nearing his majority; or members of the Navy and Air Force, who commenced their training at 18 years and even younger? They have left school, gone straight into the Services, and consequently have no idea of civil employment. On their return these men will in many instances be about 25 years of age, and will be required to fit themselves into trades and professions that were learnt by us in our late "teens." Think of

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the handicaps that these men will be faced with!

The obligation of Young Farmers' Clubs to men who are to be rehabilitated on the land is not to be lightly set aside. The high esteem in which the Y.F.C. movement is held by the soldiers overseas can be indicated by the following:—The formation of a Young Farmers' Club among our lads in Egypt in 1940, with a membership of about 120; the establishment of a chain of 14 clubs in the Pacific, with memberships ranging from 40 to well over 100; and eight clubs at present in the Middle East, all with strong memberships. Our soldiers overseas interested in farming wished to keep up their membership and retain contact with the Y.F.C. movement; others, previously in "white collar" jobs before the war, were encouraged to join up to learn something about farming, the job they have come to view as the most interesting and most healthy. On their return it is up to us, as members of the Y.F.C., to see that when arriving to take up their positions on farms these men are given the assistance they so justly deserve.

There are many ways in which we, as an organisation, can play our part. One form of help is the provision at club meetings of lectures beneficial to men who are just entering the farming world. A second form is the arranging of field days and demonstrations introducing the ever-important practical side of farming. The third, and probably the most important, way of extending assistance lies in making these men welcome to our clubs, and providing them with a simple and practical means whereby they can meet and discuss, on a friendly and helpful basis, their future aims among men of their own age, and therefore men with views similar to their own. By doing this much the Young Farmers' Clubs movement will be making a big contribution to the welfare and success of the rehabilitated man. Remember, young farmers, too much cannot be done for these men who have done so much for us.

Marton Young Farmers' Club

By Malcolm F. Gray, hon. secretary, Marton Y.F.C.

(The following history of the Marton Young Farmers' Club is of particular interest at the present time, when every effort is being made to revive clubs in recess. Mr. Gray has gone to a lot of trouble in looking up the facts in connection with his club and examining the records over a number of years. His example could well be copied by other club secretaries and officials, and we would welcome similar information in connection with other clubs for publication in this section of the "Journal.")

THE Marton Young Farmers' Club was formed on April 30, 1938, with an inaugural membership of 24. Since then it has had a somewhat chequered existence, as this brief history relates. The following officers were elected for the first year's activities:—Advisory president, Mr. H. G. Stewart. Incidentally, Mr. Stewart still holds this position. The offices of chairman, secretary, and treasurer were filled by R. S. Shield, A. B. Marshall, and D. G. Gordon respectively, assisted by a committee consisting of L. McLeay, J. M. Cranstone, V. E. S. Smith, D. G. Brice, H. C. Kimpton, and R. Carter. They were able to lead the club through a most successful opening year. Their advisory members were Messrs. E. O. Pryce, G. L. Marshall, and J. B. S. Dudding.

Membership Doubled

Just how far their efforts were rewarded with success may be gauged from the following details. In 11 months the membership rose from 24 to 52; eight meetings were held with an average attendance of about 60 per cent.; six were devoted to lectures, one for a debate, and one where five club members gave short talks; one field day was held, embracing a judging competition on Romney sheep, and a demonstration on Hereford cattle; a debate against the Hunterville Club was won by Marton. The year was concluded with a grand gala day, held at Mr. G. Lampp's property, Tutaenei Road. This was an outstanding success, and consisted of a tractor-driving competition; a lecture and demonstration on Romney sheep; sports, post-hole digging, putting the shot, double-hand sawing, 100yds. handicap, sheep weight guessing, chain-stepping, and tug-of-war v. the Farmers' Union; a tractor-driving exhibition and a demonstration with a weed-burner. The annual meeting was held in the evening and was followed by a dance, a fitting climax to the year's activities. The club entered a team in the seven-a-side football tournament arranged by the Manawatu District Committee at the National Dairy Show, and the team was successful in winning the "Golden Rooster." The club secretary gave a broadcast talk on "Culling the Ewe Flock," from Station 2YA, and the annual dance showed a profit of nearly £9.

War Forces Recess

Prospects for the following year appeared to be even more encouraging, and it is certain that the club would have attained its ambitions in full measure but for the outbreak of war. From then on a large proportion of the members joined the Armed Forces and the club was forced to go into recess in May, 1942, after two lean years, and despite many energetic endeavours to prevent the necessity of such a step.

The officers elected for the second year were:—Chairman, A. B. Marshall; secretary, H. C. Kimpton; treasurer, W. Emmett; committee, R. S. Shield, M. H. Morrison, L. McLeay, D. G. Gordon, and G. Lourie. A bank account of over £10 was handed over to the new executive, which proved that the club was on a firm financial footing. Ten meetings were held, though the average attendance showed a falling off as the year progressed. Seven of these were devoted to lectures, one to talks by club members, and one to a round-table discussion on seasonal topics. In the district debating contest the club was forced to default to the Bulls Club. The annual dance showed a profit of £4. A team was selected to play in the seven-a-side football tournament in Palmerston North, but it was then found that the contest was to be confined to the Manawatu district. Several members went on the South Island tour, and those who represented the club in the provincial sports held in Palmerston North met with considerable success. The second annual meeting was held on March 28, 1940, and the following officers were elected:—Grand patron, Mr. E. B. Gordon, M.P.; patron, Mr. G. J. L. Lampp; advisory president, Mr. H. G. Stewart (re-elected); advisory members, Messrs. A. C. Birch and G. L. Marshall; chairman, D. G. Gordon; secretary, H. C. Kimpton (re-elected); treasurer, M. H. Morrison; committee, G. Lourie, C. Smith, and A. B. Marshall. Meetings were held regularly till August, when it was decided to hold meetings over for a time, as many members were going into camp. No further meetings were held till the following June. Thus, only four meetings were held; the total membership including those in the forces was still up to 50. Two of these meetings featured lectures, one a talk by members on the South Island tour, and one debating. The secretary, H. C. Kimpton, donated a challenge cup for the district debating contest, and after winning the first two rounds against Hunterville and Bulls the club was narrowly defeated in the final by Mangaweka. In accordance with the wishes of the Dominion Executive, the club co-operated in the Centennial tree-planting scheme, and planted 100 mixed trees in Centennial Park. H. C. Kimpton left during the year to join the R.N.Z.A.F. and A. W. Fitzherbert was elected secretary to fill the vacancy.

The next annual meeting was held on June 27, 1941, when the grand patron, patron, advisory president, and advisory members were all re-appointed. The following officers were elected for the ensuing year:—Chairman, W. B. Gray; sec.-treas., Mr. H. Morrison; committee, A. B. Marshall, D. G. Gordon, K. G. Coles. The club entered for the district debating and efficiency contests. A senior and a junior team were entered for the debating, but neither was able to win the much-coveted Kimpton Trophy. Only two other meetings were held, both of which were devoted to lectures; attendances were very small. No further meeting was held till May 14, 1942, when only four were present—the advisory president, chairman, secretary-treasurer, and one member. The club had no alternative but to go into recess.

From the outbreak of war the attendance at meetings steadily decreased; this is less surprising in view of the fact that at least 28 past members of the club are, or have been, on active service. We proudly honour the names of five who have made the supreme sacrifice—R. S. Shield, H. R. Marshall, G. M. Marshall, W. Emmett, and L. Moss. At present 11 are serving overseas, four with the R.N.Z.A.F. and the remainder with the Army.

Activities Resumed

With the growing up round us of another generation and the return of several men from overseas, the club was revived on June 16, 1944, with an initial membership of 15. The officers elected were as follows:—Grand patron, Mr. E. B. Gordon, M.P.; patron, Mr. W. G. Aitken; advisory president, Mr. H. G. Stewart; advisory members, Messrs. A. C. Birch, G. L. Marshall, C. J. Craig, and G. McDonald; chairman, K. G. Coles; secretary, M. F. Gray; treasurer, H. R. Miller; committee, K. H. Smith, A. L. Vile, G. R. Gower, G. O. Meyer, A. W. Morrison, G. E. Lampp, and L. V. McKinnon. Subsequently three more were added—M. M. Marshall, G. E. Gordon, and D. I. Morrison. The club certainly seems to have come into its own again. The membership is now 38; we have entered the district efficiency and debating contests—in the latter the senior A team won the trophy in their section; we have run a successful dance; arranged the catering at a district field day, and also shouldered much of the responsibility for that function. Eight meetings have been held up to the end of the year; six have been devoted to lectures and the other two to discussions on various topics inaugurated by club members. A vigorous campaign to enrol members has been staged and a parcel and a newsletter sent to members overseas. Prospects are indeed bright—brighter in fact than since the outbreak of war—and there is every reason to suppose that our hopes of making a strong and successful unit of our club will be realised.

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OBITUARY

Mr. J. McK. JAMES,
Wangaehu, Masterton.

THE death occurred on February 20, at the age of 66 years, of Mr. John McKenzie James, one of the Wairarapa's best-known farmers and breeders. He was associated with Y.F.C. affairs from the inception of the movement in the Wairarapa, and he assisted in the establishment of the Masterton Young Farmers' Club in December, 1934. He was a member of the first Wairarapa Y.F.C. Provincial Council, set up in September, 1935, and later, under the reorganisation in August, 1936, became a valued member of the Wairarapa Y.F.C. District Committee. He remained actively associated with the Young Farmers' Clubs movement until recent months, when he was forced by ill health to withdraw from many of his public activities.

"Jack" James, as he was familiarly called, was known throughout the Dominion. As a breeder he established his well-known stud of purebred Hereford cattle, and was a discerning judge of stock, being judge at the Royal Agricultural Shows in Hereford and fat cattle classes. He held the office of president of the Masterton A. and P. Association from 1922 to 1924, and was chairman of the Masterton branch of the N.Z. Farmers' Union for many years. He was a member of the Royal Agricultural Society, and the Wairarapa, Manawatu, Hawke's Bay, and Dannevirke A. and P. Associations. He was a member of the executive of the Wairarapa Sheepowners' Federation and of the Council of the N.Z. Hereford Cattle Breeders' Society. He was also president of the Wairarapa Collie Club.

A keen supporter of racing, Mr. James was president of the Masterton Racing Club and a delegate to the N.Z. Racing Conference. He raced the brilliant sprinter Poutatau with notable success. He was a district representative for some years on the Meat Board electoral committee, and was chairman of the Wairarapa Primary Production Council. During the depression he was a member of the Masterton Unemployment Committee. "Jack" James will be missed by his many friends and acquaintances in Y.F.C. and farming circles generally, and also in community affairs. The sympathy of all Y.F.C. members is extended to his family.

Mr. W. JAMES,
Upper Plain, Masterton.

FOLLOWING close upon the death of his brother, the late Mr. J. McK. James, came the death on March 4 of Mr. William James, one of the Wairarapa's most prominent farmers, at the age of 62. "Bill" James will be sadly missed, particularly by his young farmer friends. He was actively associated with the Y.F.C. movement in the Wairarapa, and was a foundation member of the Masterton Young Farmers' Club. He was chairman of the Wairarapa Y.F.C. District Committee from 1938 to 1943, and remained a member of that body until his death; he was also a member of the Wellington Y.F.C. Council over a number of years.

Mr. James was well known in farming circles; he established the Wai-iti stud Southdown flock, and was most successful with his wool and fat lamb production. His notable successes included winning the Fitter Cup twice for the best lamb for the Home market, and he also won the Argentine Cup for the grand champion pen, all breeds. He was an active member of the Masterton A. and P. Association, and was its president during jubilee year. He was a member of the Southdown Breeders' Association and the Masterton Racing Club. He was also a director of the Caledonian Society and a member of the St. Andrew Society. A keen member of the N.Z. Farmers' Union, Mr. James was also a member of the Masterton Collie Club. He also took a prominent part in any movement affecting the well-being of the farming community. He was chairman for many years of the Fernridge School Committee, and during the present war was a member of the Primary Production Council. In the Great War Mr. James served with the Rifle Brigade. The sympathy of all Y.F.C. members is extended to Mrs. James and family. There is one son, Henry Allen James (at present hon. secretary to the Masterton Young Farmers' Club) and one daughter, Miss Mary Elizabeth James (Palmerston North Hospital).

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The weight of a cubic foot of roots in a clamp or pit is as follows:—Turnips, 33lb.; swedes, 34lb.; mangolds, 35lb.; carrots, 31lb.; parsnips, 31lb.; potatoes, 42lb.

Visit to Massey College

By L. J. Ranford, Club Reporter, Whakarongo Y.F.C.

THE opportunity to inspect the Massey Agricultural College farm and buildings was given recently to members of the Whakarongo Young Farmers' Club. The various college activities were outlined by Mr. A. W. Hudson to 25 members and farmer friends, after which the visitors were conducted around the farm sections by Mr. L. A. G. Barrett; the first of these was the experimental sheep farm, where foot-rot has been successfully dealt with during the past two years. Inspections of the mole-draining system and the poultry farm followed. Of particular interest was the ensilage-making in progress in both pit and stack. Mr. V. C. Goodall, who is in charge of the silage experiments, explained the various types of stacks and how they were treated. It was interesting to learn that stacks finished with coned grass tops have equal results to those with earth to weight them. Experiments were also being made with molasses, sulphuric acid and water sprays, to determine which are the most digestible for cattle. Each load of green grass was weighed before being stacked to find out how much loss of moisture takes place in the stack or silo.

After a quick inspection of the dairy factory the party returned to the college, where lunch was provided. In the afternoon members were shown the wool-classing room, where Mr. Barrett described the different types of wool. At the rear of this building are the carpentry and engineering workshops; here Mr. S. G. Dawe gave an interesting account of the work. The remainder of the afternoon was spent in a lecture room discussing with Mr. J. Hodgson, of the veterinary department, various dairying experiments and means of maintaining food production throughout the winter. Many trials with calf-rearing have taken place, and it has been proved that calves fed on meal and skim-milk progressed quicker than those fed on skim-milk alone, being fed the same proportions; the meal-fed calves thrived even better when weaned.

At the conclusion of a very interesting and instructive day Mr. I. G. Tabor, chairman of the Whakarongo Y.F.C., thanked those who had so generously spared their time for the benefit of the club members.

Reports on Club Activities

EASTERN SOUTHLAND.

Five Rivers.—Business meeting. General discussions. One new member enrolled. Seven members present out of a total of 24.

SOUTH OTAGO.

Warepa.—Annual meeting. Officers elected: Advisory president, Mr. G. Ayson; chairman, E. Cook; vice-chairman, G. Houliston; secretary, G. McKenzie; advisory members, Messrs. L. Christie, J. Cook, and A. Ross. Post Office Savings Bank account to be opened, with A. Gordon and G. Shanks as trustees. Arrangements for speaker at next meeting. The matter of supper at meetings was fully discussed and satisfactory arrangements finalised. Two new members enrolled. Ten members present out of 31.

DUNEDIN.

Mosgiel D.H.S.—Address by Mr. J. H. Cumberbeach on the club's activities generally. Forty-seven members present out of 49.

MARLBOROUGH.

Seddon.—Invitation received from the Awatere County Council to send a deputation to their next meeting to discuss the matter of the spread of nasella tussock; the invitation was accepted. During discussion the following suggestions were made: That trees be planted on infested boundaries, and also in the river-bed if possible; that the club arrange for a "window display" and supply all material; that a field day be held on the tussock infested areas. The meeting then took the form of a "quiz" programme, the chairman for the evening being H. Gluyas, of the Grassmere-Tetley Brook zone. The "quiz" proved very interesting and instructive. Nine members present out of 26.

HOROWHENUA.

Levin.—Annual meeting. Officers elected: Advisory president, Mr. H. J. Lancaster; chairman, R. Speedy; secretary-treasurer, S. Lancaster. There was an attendance of 15 active and two advisory members. At meetings previously unreported the speakers were as follows: Mr. C. Webb ("Ayrshire Cattle"); Mr. A. J. Galpin ("Post-war Problems of the Y.F.C."); Mr. P. McGregor ("Veterinary Problems"); Mr. E. Bruce Levy ("Grassland Research"). The attendance at these meetings ranged from 10 members up to 17. A "Hayseeds" Ball was held, the club netting a profit of £23.

MANAWATU.

Apiti.—General business. Talk by Mr. Harry Cowan, on "Norfolk Island." Seventeen members attended out of 37.

Bunnythorpe.—Welcome extended to returned members. M. Donald appointed as steward for the Y.F.C. section at the Women's Institute Show; Mr. H. de O. Chamberlain (Department of Agriculture) to be asked to act as judge. Address by 2nd Lieut. A. O'Donnell on "Countries I have Visited." Ten members present out of 14.

Oroua Downs.—Arrangements finalised for the Y.F.C. relay race to be run at the Oroua Downs sports meeting. Films exhibited by Mr. G. H. Dawick, secretary, N.Z. Jersey Cattle-breeders' Association; the films, which were very interesting, were taken by Mr. Dawick on his classification tours of the Dominion. There was an attendance of 25 members out of 33.

Pohangina Valley.—Annual meeting. Officers elected: Advisory president, Mr. L. J. Linklater; chairman, J. Howell; secretary, R. G. Passey; treasurer, H. McDonald. Twenty-three members present out of 30.

Rongotea.—Arrangements for a field day at Longburn Freezing Works. Four new members enrolled. Talk by Mr. Brown, N.Z. Loan and Mercantile Agency, Palmerston North, on "First Aid on the Farm." Twenty-one members in attendance out of 28.

Whakarongo.—Members asked to compete at the Bunnythorpe Women's Institute Show; special classes for young farmers, including eight different vegetable exhibits, also a special prize donated by the Bunnythorpe Club for the Y.F.C. member gaining the most points outside the Y.F.C. section. Several members announced their intention of competing. A talk was given by D. Newcombe, a club member, on "Lucerne"; the speaker dealt with the preparation of the land, sowing of the seed, and the care of the crop. An address was given by Mr. A. J. Galpin, of Bunnythorpe; Mr. Galpin spoke on the usefulness of the Y.F.C. movement, and expressed ideas as to how the organisation could benefit the farming community, especially the younger section. He pointed out the danger of "commercialised farming," and laid stress on the idea that farming is a way of living and not merely a means of making money. Mr. Galpin's address was greatly appreciated by the meeting. There was an attendance of 19 out of a total membership of 24. At the annual meeting the following officers were elected: Advisory president, Mr. J. McCool; chairman, I. G. Tabor; vice-chairman, J. Spall; secretary, D. Newcombe; treasurer, B. McCool; club reporter, L. Ranford. The Dominion Organising Secretary, Mr. S. Freeman, was present at the meeting, and spoke on Y.F.C. affairs generally. There was an attendance of 22 members out of 24.

WANGANUI.

Hunterville.—Three new members enrolled. Decided to hold a field day on Mr. Chisholm's property. An impromptu debate was held, the subject being "Sheep v. Cows"; all members present took part, H. England leading the sheep-farmers and B. Cameron the dairymen. The adjudicator, Mr. Chisholm, gave the decision to the supporters of the dairy-farmer. There were 20 members present out of 27.

Mangaweka.—Lengthy discussion on correspondence, etc. Pilot Officer Murphy, recently returned from England, was present at the meeting. A discussion took place on the proposed district stock-judging field day, and it was decided to contact the Taihape Club at an early date regarding the arrangements. A remit was passed for forwarding to the next meeting of the Wanganui District Committee, "That district committee meetings be held alternately at each centre, commencing at the next annual meeting." It was considered that this would be more fair to delegates from the various clubs, and would tend to overcome some of the difficulties of transport. There were seven members present out of 15.

Marton.—Sub-committee appointed to go into the matter of a proposed grant of finance from the district committee. Report on district sports meeting held at Rata. Club to enter a team to compete in the inter-club relay race at Oroua Downs sports. Club field day abandoned temporarily owing to pressure of seasonal work. Decided to hold a social to wind up the year's activities. The meeting was held at the Huntley School, and the club had obtained a programme of sound films from the Education Department and Educational Sound Films Ltd., using the projector belonging to the school. The programme, which was intensely interesting, consisted of the following films: "Farmall does the Job"; "Seed Production" (Plant Research Station, Aberystwith); "Sheep Dog"; "John Bull"; "Power in the Potato Field"; "This was England"; and "Harvests for Tomorrow." There was an attendance of 24 members out of 36.

SOUTHERN HAWKE'S BAY.

Ballance.—Annual meeting. Officers elected: Patron, Mr. J. H. Bremner; advisory president, Mr. C. J. Eising; chairman, Q. Holdaway; secretary, L. A. Sinclair; treasurer, L. Polglase. There were 15 members present out of 20.

Dannevirke.—Seventeen new members enrolled at the first meeting in the New Year. Hearty welcome to L. K. Carswill (who has served in the Pacific Forces and is now discharged) by the chairman and the advisory president (Mr. L. Feierabend). Secretary instructed to write to G. Turner, who has left the district, and to B. Ellingham, who has entered the Army. Talk by Mr. L. K. Carswill on "The Vegetation, Farming, and Natives, etc., in the Pacific Islands." Forty members present.

Woodville.—Address by Mr. W. Smythe on "The Care and Training of a Young Dog." Fourteen members present out of 25.

TE KUITI.

Te Anga Central.—Arrangements for a field day. Talks given by club members as follows: "Breaking in Hill-country for Sheep" (N. Stokes); "Breaking in Swamp-land" (R. Burt); "Land Development" (G. White). Seventeen members present out of 21.

WAIKATO.

Cambridge.—Report on New Year Dance—profit of £22 10s. 2d. Dance to be held in aid of an appeal from the St. John's Ambulance. Full support to be given to the local A. and P. Show. Arrangements made for a veterinary field day. Mr. A. Myers, who was president of the Y.F.C. among the troops in the Pacific, gave a very interesting talk on the workings of the Y.F.C. in the 3rd Div.; following this he spoke on "Farming in Fiji and New Caledonia." There was an attendance of 22 out of a total membership of 60.

Okoroire.—Mr. Martellett appointed to operate the bank account with R. J. Makgill, in succession to Mr. E. Coats who has resigned. The advisory president, Mr. W. B. Hardwick, read a letter from Mr. Weiler, of the Future Farmers of America, a counterpart of the Y.F.C., suggesting that the two organisations had much in common and could assist one another. It was decided to forward the letter on to the Dominion Organising Secretary. Resignation of W. G. L. Ring, club secretary, accepted with regret; Mr. Ring resigned on account of military duties. Address by Mr. Fitzgerald on "Mendel's Law of Heredity." Fifteen members present out of 33.

Te Awamutu.—Annual meeting. Officers elected: Advisory president, Mr. A. S. Wyllie; chairman, C. Eyre; secretary, F. Turner; treasurer, A. Smart. Thirty-five members present. At a previous meeting the chairman, C. Eyre, gave an address on his experiences in the Middle East; his adventures while attached to the long range desert patrol were particularly interesting. There were 35 members in attendance out of a total of 57. Eighteen members attended a field day held at the Horotiu Freezing Works recently, and took part in judging competitions for pigs, the results being as follows: On hoof—T. W. Ray, first and second; D. R. Hodgson, third; on hooks—T. W. Ray, first and second; L. Sayer, third. Mr. E. Kneebone (chief grading inspector) gave a valuable demonstration, showing members the finer points of pigs that had been exhibited at the Te Awamutu Show.

Te Pahu.—Business meeting. Dance to be held. Preparation of a programme of lectures. Eleven members present out of 28.

BAY OF PLENTY.

Kati Kati.—Arrangements for a dance and an athletic meeting. A practice debate held in preparation for inter-club debates in the coming winter, all members taking part. The subject was "That Tractors have Rendered the use of Horses Unnecessary in New Zealand today." Fourteen members present out of 29.

Paengaroa.—One new member enrolled. Arrangements finalised for the annual calf rearing competition and for an athletic meeting to be held to raise money for the Y.F.C. memorial fund. Mr. Brown, the Mayor of Te Puke, gave an address on "Early Days of Te Puke"; the speaker touched on all aspects of the subject of interest to farmers. Twenty-two members present. At the previous meeting Mr. Gosling, of R. B. Swann and Co., gave an address on "Farm Bookkeeping and Income Tax Statistics"; this talk proved most interesting and instructive. There were 21 members present.

Pukehina.—Business meeting. One new member enrolled. Arrangements in connection with the sports meetings at Te Puke and Tauranga; also discussion regarding means of transport. Discussion on the debating contest. Ten members present out of 24. At a previously unreported meeting a lecture was given by Mr. Austin, Pongakawa State Forest, on "Trees for Shelter; and Atmospheric Conditions." Twelve members in attendance.

Te Puna.—Business meeting. One new member enrolled. Committee appointed to make preparations for a proposed concert.

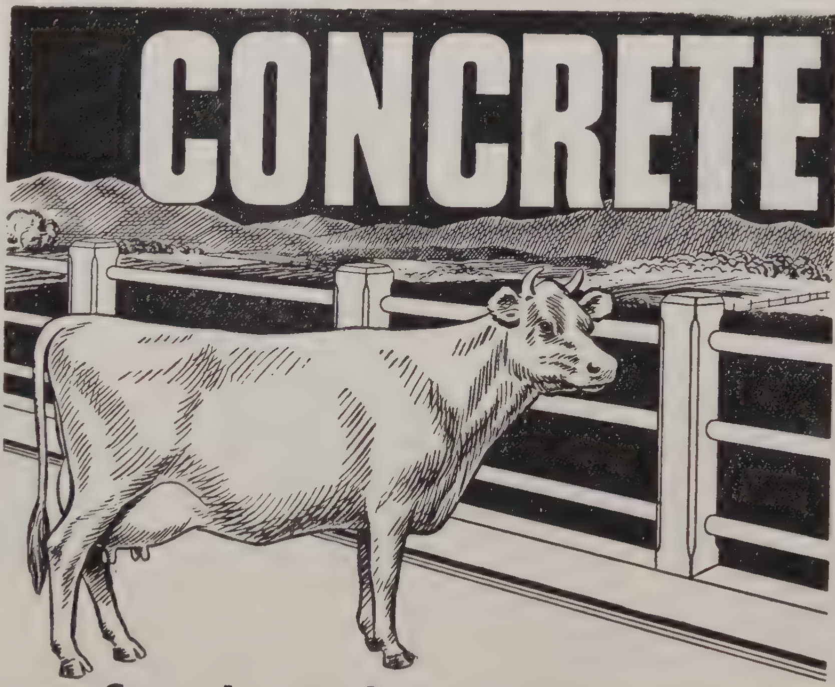
Waimana.—Address by Mr. C. R. Waimana, the subject being "Experiences Overseas"; Mr. Waimana dealt with, among other matters, farming conditions in both Canada and Great Britain.

Welcome Bay.—Field day to be held on Mr. Bennett's farm at Papamoa; prizes to be awarded for dairy-cow judging in both junior and senior classes. The meeting was very fortunate in having present Lt. A. J. Voss, D.C.M., M.C., who held the interest of members for about two hours, giving them a most instructive talk on how an infantry company is organised and supported in Italy. Lt. Voss demonstrated many points with the aid of a blackboard, and at the conclusion of his address handed round many souvenirs and also scrapbooks filled with newspaper clippings and photos of New Zealanders that appeared in the papers during the lengthy period that he had been overseas. Lt. Voss was formerly chairman (1938) and secretary (1939) of the Tauranga Club, and was a foundation member of that club. There were 17 members present out of a total of 25.

AUCKLAND.

East Tamaki.—Arrangements for a field day to be held at Ambury's Milk-treating Plant. Team to be entered in the tug-of-war contest at the East Tamaki patriotic sports meeting. Address by Mr. Neal on "General Farming." Attendance of 18 out of 44.

Franklin.—Rama Rama hall committee to be approached in regard to hall-hire charges in the event of the club deciding to change its headquarters. Lecture by Mr. H. W. Carbury, Government Veterinarian, Auckland, on "Veterinary Remedies that can be applied by the Farmer." Twenty-one members present out of 26. At the previous meeting a social committee was appointed, and an informal discussion on "Concreting," led by L. W. Aldridge, promoted lively interest, many worthwhile suggestions being brought forward. At this meeting 26 members were present, being 100 per cent. attendance.



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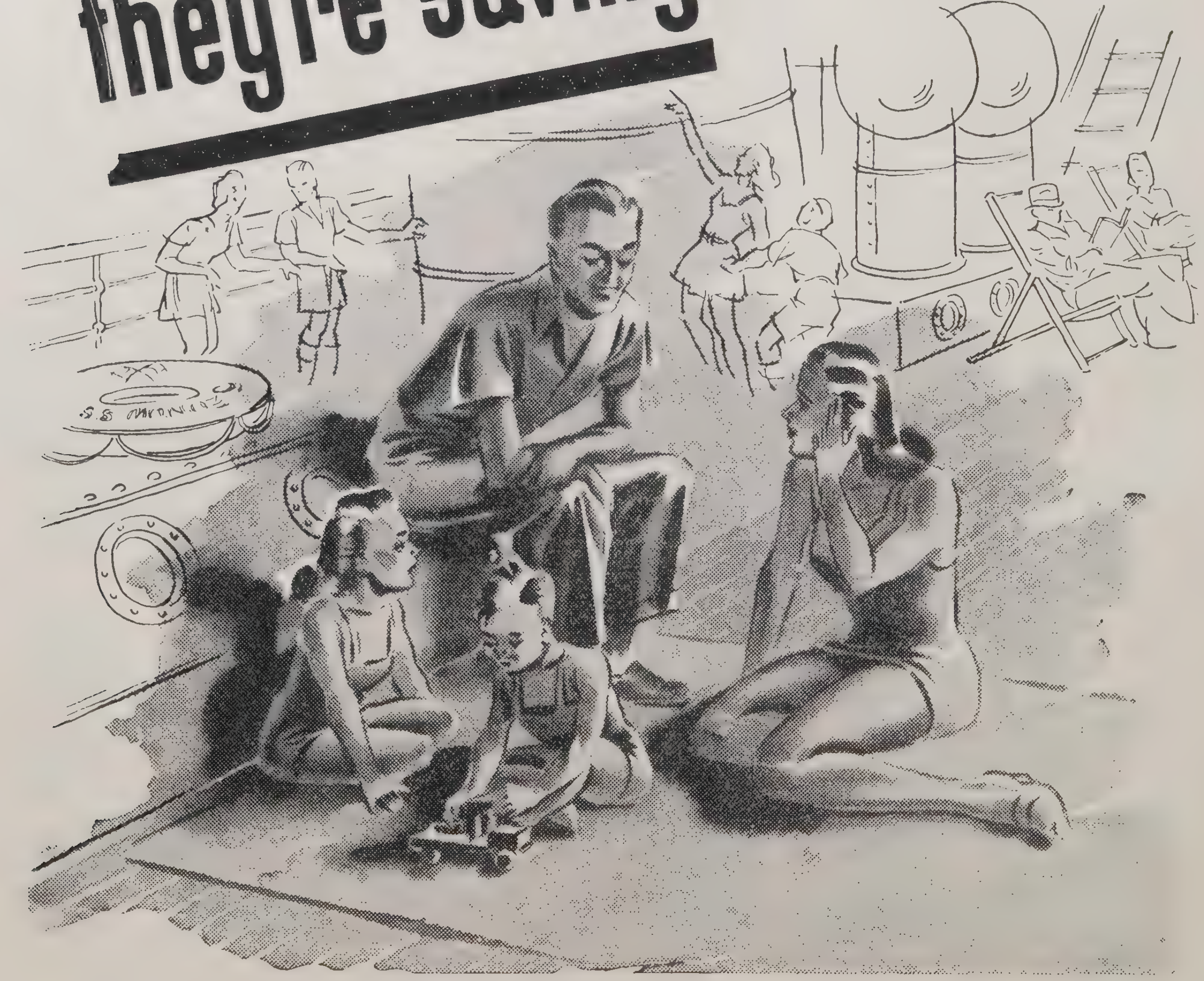


This post-war picture will be fact—not phantasy. In a forthright answer to the nation's call to save, in steady week-by-week deposits to National War Savings, this family is building better than they know. For they've helped, and are still helping, to keep New Zealand financially strong. After the war their savings will bring them something they've often dreamed of . . . but never hoped, until now, to achieve. And they're *still* saving — are *you*?

3 % NATIONAL *War* SAVINGS

WS. 59. 24

THE GOOD NEIGHBOUR

MEDITATION

IT was a woman who wrote:—

"I am tired of all voices. Friend and foe
Have come too nearly with me to the shrine
That is the secret kept by wind and fire.
Now when the shadowy hands of dusk are cool
About my eyes, shall silence like a god,
Drive them with whip of starlight from his stairs,
Only the small grass striving in its clod,
Only the stream, that fragile moonlight bears
Like blossoms on its breast, move in this place."

How often in these strenuous times we experience that longing to get away by ourselves for a little while and "think our own thoughts" in peaceful silence. We are now well into our sixth year of war, and though we have mercifully been saved from the bombings and hardships which have been the fate of so many people in other countries, we are not insensible to their sufferings, nor have we escaped our share of grief and loss. The tempo of our living has inevitably quickened, and strain and anxiety over absent loved ones take constant toll of our energies, so that the need for periods of solitude and quiet becomes more imperative than ever before. For not only do such spells relax the tension in our nerves and benefit us physically, but they also give us a chance to adjust our ideas to changing conditions, to restore our serenity of spirit, and renew our belief in truth and goodness, so that we feel once more that we have something we can give to those who come to us for comfort and help.

I once asked one of the busiest women I know the secret of her tireless activity. (No family was ever better looked after than hers; she kept open house, was a tower of strength to the various organisations of which she was a member, and always found time to have a friendly chat with a neighbour or assist anyone in trouble). Her reply was that she made it a rule to set apart a short portion of each day for meditation, preferably first thing in the morning. "If I miss my time of quiet, everything seems to get out of hand, and I lose the feeling of being able to cope," she explained.

Maybe her choice of time would not suit all of us, and maybe our timetable is already overcrowded, but if we are to give of our best, we must make some opportunity to "detach ourselves from the mechanics of living" and contemplate life itself.

There are many tests of friendship, but to my mind one of the most important is the ability to be silent with a person—

"More than words that flow from friend to friend
In utterance unbroken to the end,
Are velvet aisles of silence when no sound
Dare violate a language more profound."

My happiest memory of a recent holiday is not of the gaiety and laughter with which it abounded, but of seeing three tuis sipping honey from the red-gold flax-flowers, and watching the delicate tracery of sunlight and shadow among trees, and the tide weaving white foam-patterns along a curve of shore—and sharing that beauty silently with a friend. That is companionship of a very special and very precious kind.

"So many wonders are achieved in silence.
The dawn drifts quietly from night's long arm.
The rose breaks into blossoming through silence.
The stars come from the dark without alarm.
The first green blade of grass pushes in silence
From the vast caverns of earth's mystery.
The snow comes down and wraps the world in silence.
The forest fern is mute; so is the tree.
The beautiful and good are wrought in silence.
. . . . We would do well to cultivate
This mood of Nature, knowing that in silence
We may augment our strength and dream, and wait."

We cannot evade the difficulties and disappointments that fall to our lot, but the fortitude with which we face them will be greatly strengthened by our habit of thinking for ourselves and our endeavour to understand the fundamental truths of life.

Mary

Back

TO HIS EASY CHAIR

Many times during the din of battle he has dreamed of this day, when he will stretch his feet before his own fire once more and return to the comforts of home. And Onehunga Blankets, which have kept him warm on service, will be on his bed to ensure him a well-earned rest.

Swinging slowly from war to peace production, Onehunga Blankets are now available in small quantities for civilian needs. Enquire from time to time at your usual dealers until your are lucky enough to invest in Onehunga quality.

ONEHUNGA

ONEHUNGA BLANKETS —— AIR-CELL BLANKETS —— ONEHUNGA WOOLLENS & TRAVEL RUGS. Distributors: SARGOOD, SON & EWEN LTD.

Variety With Root Vegetables

ROOT vegetables should be a major constituent of New Zealand meals, and on their preparation and cooking depends very largely whether their great nutritive values are retained. The following kitchen hints and recipes, reprinted from a bulletin issued by the Bureau of Human Nutrition and Home Economics of the United States Department of Agriculture, should contain some useful ideas for housewives in this country.

BEETROOT . . . carrots . . turnips, white, yellow, purple-topped . . . parsnips . . . green spring onions, brown and silver-skinned onions—these vegetables bring vitamins, minerals, starches, and sugars to help supply the body's needs.

When the Saucepan Boils

To make the most of minerals, vitamins, and flavour . . .

Start root vegetables in boiling salted water . . . about 1 teaspoon of salt to a quart of water.

With young tender roots use only enough water to prevent sticking to the pan. For older roots have enough water to cover.

Boil root vegetables whole in their skins unless too strong or tough.

If peel you must, make the peelings thin, or scrape no more than skin deep.

To keep beetroot from losing its bright red, leave on the long taproot and an inch or two of stems. A quick dip into cold water loosens the jacket on a cooked beetroot so it slips off like a glove.

To speed cooking time . . . save fuel . . . conserve vitamins, cover the saucepan. If not overcooked, even onions and turnips are not too strong flavoured.

Slice or dice to cut cooking time more.

To bring out their best cook root vegetables only until tender. Don't overcook.

Serve in their own juice, or if too much, use right away in soup, sauce, gravy, or vegetable cocktail.

Season to Taste

Easiest way to season a plain-cooked hot vegetable is to add salt and pepper to taste and a little dripping or melted fat, just before serving.

Or some like a little milk added at the last minute to cooked carrots, turnips, or onions.

To give more "lift" now and then, drop in a little chopped onion, green onion tops, parsley, or chives.

A little vinegar or a squeeze or two of lemon juice adds a pleasantly sour note to seasoning for boiled carrots, beetroot, or turnips.

Be "Saucy" Now and Then

White sauce blends well with plain-cooked onions, carrots, parsnips, or turnips.

For a medium-thick sauce to serve over vegetables blend 3 tablespoons of flour with 3 tablespoons of fat. Add 1½ cups of milk. Cook 5 minutes, stirring constantly to make the sauce smooth. Season to taste with salt and pepper. This makes enough sauce to mix with 3 cups of cooked vegetables.

Some vegetables are better with a thin white sauce, made with 2 tablespoons of fat to 2 of flour, for 1½ cups of milk.

Invent your own.—To the white sauce add left-over bits of meat or fish, or hard-boiled egg, or grated cheese.

For a thrifty family-size scalloped dish, combine left-overs of vegetables too small to serve by themselves with a white sauce—plain or fancy. Top with bread crumbs and bake until bubbling and brown.

Recipes which follow are for 6 servings and take about 2lb. of raw vegetables.

BEETROOT.

Bulbs and Tops

Cook small beetroot and tops in water until tender (15 or 20 minutes), drain, and chop together. Season with fat, salt, and pepper.

Or use the tops of larger beetroot if they are still crisp and green. They may take longer cooking, but are high in food value.

Harvard Beetroot

1 tablespoon cornstarch or 2 tablespoons flour, 2 to 4 tablespoons sugar, ½ teaspoon salt, ¼ cup vinegar, ¼ cup water, 2 tablespoons fat, 3 cups cooked beetroot, sliced.

Mix cornstarch or flour, sugar, and salt. Add vinegar and water and boil 5 minutes, stirring constantly. Add the fat and beetroot, and let stand until the sauce becomes red. Reheat if necessary.

Beetroot Soup

Here's a quick way to make beetroot soup something like Russian borsch, but using left-overs.

Add finely-chopped cooked beetroot to meat broth, along with chopped cooked onion, carrot, or cabbage. Season with herbs and serve hot. Some like beetroot soup topped with sour cream.

PARSNIPS.

Browned Parsnips

To get rid of the woody core, boil

Watch the pot... don't overcook

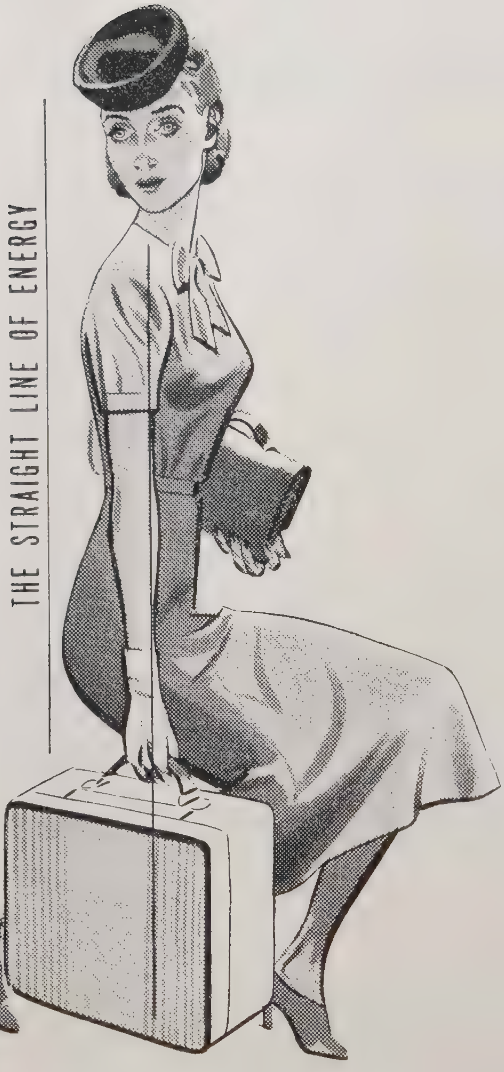
GUIDE TO BOILING

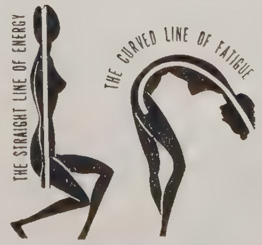
Beetroot—young		30-45 minutes
	older	60-90 minutes
Carrots—young		15-20 minutes
	older	20-25 minutes
Parsnips		20-30 minutes
Onions		30-40 minutes
Turnips		15-20 minutes

MAKE A BEAUTY EXERCISE OF IT

Once upon a time (in those almost fairy-tale days of gallants galore) you'd never have had to carry your luggage! Now it's just another load you tackle. But—and *this* is no fairy-tale—you can turn every chore into a health and beauty routine.

It's all in the way you hold yourself. Lift a weight with back upright, the weight in line of least resistance to your spine. And bend to jobs like cleaning, weeding, writing, from the hips (nature's hinge) with a straight back. This way you slim your hips, strengthen your bosom line, and help yourself to that perenially young look that comes from an erect bearing. And what's more, you tire less. A small initial effort to remember and good posture is soon force of habit. And now that it's practically a patriotic duty to keep fit, why it's a personal war effort, remembering!


THE STRAIGHT LINE OF ENERGY


THE STRAIGHT LINE OF ENERGY
THE CURVED LINE OF FATIGUE

Published in the interests of your better posture by Berlei, who have long encouraged good posture with their accurate fitting foundations. For only the right fitting garment can give your figure the necessary support and persuasion for good posture. And the scientific classification of figure types and their variations, on which Berleis are designed, is the true basis of infallible fit. Make sure, in these times of shortage, that the garment you buy is the Berlei prescribed for you by the Berlei Type Indicator.

Berlei
TRUE-TO-TYPE FOUNDATIONS

the parsnips whole, split lengthwise, and strip out the tough centre. Dip the halves in flour and fry in fat until they are golden brown. Or mash and season the parsnips to make little cakes, and fry them.

Scalloped Parsnips

Arrange cooked parsnips, split lengthwise, in a shallow baking dish, pour over them medium white sauce, sprinkle with bread crumbs, and bake until brown and bubbly.

CARROTS AND TURNIPS.

Panned Carrots

Slice carrots thin. Place in a frying pan with a little melted fat, cover, cook slowly until tender. Season with salt and pepper.

If desired, fry carrots with sliced onions.

With apples.—Cut the carrots in strips and cook as above until almost tender. Then add apples sliced in rings with the skins on, sprinkle with salt and sugar, and brown well.

Carrot Scallop

1 egg, 1 cup milk, 3 cups raw carrots, cut fine, 1 tablespoon melted fat.

Beat the egg slightly. Add the milk, grated, ground, or finely chopped carrots, fat, and salt and pepper. Pour into a greased baking dish. Bake in a moderate oven until set.

Quick Carrot or Turnip Soup

Cook 2 tablespoons of finely chopped onion in 2 tablespoons of fat for a few minutes. Stir in 2 tablespoons of flour. Add 1 quart of heated milk and 1 cup of grated, minced, or finely chopped raw carrots or turnips. Season with salt and pepper. Stir well and cook until tender, about 10 minutes.

Carrots or Turnips O'Brien

Chop cooked carrots or turnips and season with salt and pepper. Melt 2 tablespoons of fat in a frying pan and spread a thin layer of the vegetable in the pan. Heat slowly, serve hot.

Turnips and Tops

Cook small turnips and their tops together just as you would small beetroot.

ONIONS.

Onion Soup

Cook 2 cups finely chopped onions in 2 tablespoons fat until lightly brown. Sprinkle with 3 tablespoons of flour and stir. Add 1½ quarts hot meat broth, made by cooking a soup bone in water, and stir until smooth. Season with salt and pepper and simmer until the onions are tender and flavour well blended. Serve in bowls with a slice of toast in each.

If you have cheese on hand, grate a little over the toast.

Spring Onions on Toast

If you have an abundance of spring onions, allow 6 or 7 finger-size ones to each serving. Cook, green tops and all, until tender in lightly salted boiling water, about 20 minutes if onions are young and fresh. Season with melted fat and serve on toast.

Scalloped Onions and Peanuts

Measure 3 cups of cooked onions, 1 cup of ground roasted peanuts, 1 cup of thin white sauce, 1 cup of bread crumbs blended with a little melted fat. In a baking dish make alternate layers of onions, peanuts, and sauce. Cover the top with bread crumbs. Bake in a moderate oven until crumbs are golden brown.

Stewed Onions and Tomatoes

Stew sliced onions with tomatoes, thicken with a little flour or stale bread toasted and broken into small pieces.

ROOTS AND ROAST.

Place root vegetables around a pot roast when the meat is nearly done. Make it any combination you like—onions, potatoes, turnips, carrots, whole or in halves. Cook under a lid until the vegetables are almost tender, then baste with the meat broth, and let brown lightly. Serve on a hot platter with vegetables circling the meat.

MIX YOUR VEGETABLES.

Vegetable Soup

Simmer a soup bone in water. To each quart of this meat broth allow—

1 medium-size onion, 2 small carrots, 1 turnip, 1 medium-size potato, pepper, 2 stalks celery and leaves, 1 cup tomato juice and pulp.

Cut all the vegetables about the same size and shape. Cook until tender in the salted meat stock. Season well and serve hot.

Vegetable Chowder

Make chowder with the same vegetables as for soup, but use milk instead of meat broth. Brown the onion first in meat drippings. Then add the cut-up vegetables and 2 cups of boiling water. Cook until vegetables are tender. Add 3 cups of hot milk, ¼ cup of bread crumbs, and season to taste. Serve hot.

Vegetable Stew or Pie

Use half as much meat broth and the same quantity of vegetables as for vegetable soup. Thicken with a tablespoon of flour mixed with cold water, and you have a delicious stew.

Or put the stew in a baking dish, cover with pastry or with mashed potatoes, and bake in a hot oven.

SOME RAW.

For a relish to eat raw with salt, serve spring onions, young turnips, and carrots cut in thin sticks.

For a salad to mix with dressing . . .

Shredded raw carrots with sliced cabbage, or diced apple.

Shredded carrots and cottage cheese balls.

For a sandwich, shredded raw carrot with chopped nuts or raisins, mixed with dripping.

Tender and tasty vegetables help to keep wartime meals balanced when other foods are scarce.

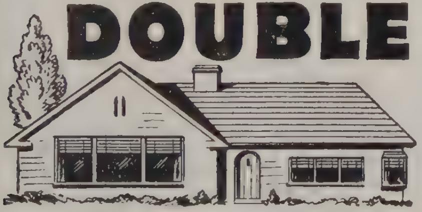
Every root vegetable has its virtues. Carrots, for instance, have a high vitamin A content. Turnips, especially if eaten raw, help to fill the vitamin C quota. Onions are the world's most popular seasoner.

To get the good from vegetables—

Eat some raw, some cooked.

Cook quickly; use all the juices.

Store to keep crisp and plump. Root vegetables like a cool, moist place best. One exception—onions—like it cool and dry.


DOUBLE

the Life of Timber Houses

Report of State Forest Service says houses will last twice as long through careful *maintenance*. Boracure, the nation-wide wood preservation service supply experts who will examine your property at regular intervals and report on condition of timber. They watch ventilation, drainage, insect and fungal attack and advise on steps to be taken. This service costs a tiny fraction of your investment at stake. Get full details. Decay can cost you hundreds.

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BAKING

For all household baking including scones, gems, biscuits and sponges. Health-giving and very tasty.

"MALTO" is made by
A. MURDOCH & Co. (Dn.) Ltd.
The grocer has it.

THE TURNBULL LIBRARY

Top:
The entrance hall.

Lower left:
The exhibition room, ground floor.

Lower right:
A corner of the stairway.

RARE books, modern books, books centuries old; books bound in elaborate, coloured leathers, books with ordinary cloth covers, books in MS; books that are classics of English literature, books in native dialects—all are to be found in the Alexander Turnbull Library, in the treble-storey brick building whose many gables and oriel windows look on to the green shrubbery flanking the Houses of Parliament opposite. It is indeed a fitting setting for a national library, for the 60,000 volumes which form the basis of the collection were bequeathed by their owner to the King in trust for the people of New Zealand.

SINCE 1920, when the library was first opened to the public, another 40,000 volumes have been added, many of them donated by private citizens, the largest individual gift being the 15,000 volumes comprising the late Sir Joseph Kinsey's collection. The library is maintained by the Government and a grant is made for the purchase of books on special subjects, particularly those relative to New Zealand or the Pacific.

The Founder

The founder of the library, Alexander Horsburgh Turnbull, was born in Wellington on September 14, 1868, and received his early schooling here. Later he went to England, where he attended Dulwich College in order to complete his education, and subsequently entered the London office of his father's firm. It was through his hobby of book collecting during this period that he came into contact with the Old World's leading booksellers and agents, and these connections proved extremely helpful to him when he returned to his own country, and many a valuable and unusual item was brought to his notice by these means. He never married, being well content with the never-failing companionship of his beloved books. He also took an active part in the merchant shipping business established by his Scottish father, and was very fond of yachting, a pastime in which he excelled. In fact, the sole literary effort to which his pen was inspired consisted of an account, printed privately, of his cruise to Queen Charlotte Sound in the year 1902. I was interested to hear that his yacht, Iorangi, in which he made the trip, is still in commission. I also learned that the site of the Bowen Street Hospital originally belonged to the Turnbull estate, and the old family home, "Elibank," is now used as the nurses' home. After the sale of the property Alexander Turnbull took up residence in the new mansion he had erected on the remaining land, and he lived there till his death at the regrettably early age of 50.

His portrait occupies the place of honour in the entrance hall where he so often welcomed visitors. One of his housekeepers still looks after the domestic side of things, and though the erstwhile dining-room has been transformed into an office complete with typewriters and filing cabinets, the cream-tiled fireplace remains and the white-painted walls are hung with choice water colours and sketches just as they were in his lifetime. Further paintings, mostly of New Zealand scenes in the early days, line the staircase leading to the pleasant reading room (once his sleeping quarters). Altogether, 11 rooms have been given over to books. Many of the most precious ones are kept in the spacious apartment where he spent so much of his time reading and studying. The floor is carpeted in a soft-toned floral pattern, the walls are panelled in Australian blackwood, and at one end is a handsome fireplace of grey and white stone surmounted by a study in oils of the father of the man whose bookplate depicts a stalwart ancestor grasping a bull by the horns and turning it aside from his path. Opposite the door stands a regal looking chair carved from part of the teak decking of the barque Inconstant, which was wrecked in 1850 off Point Inconstant, whence the name derives.

Famous First Editions

Here, in this room, are first editions of "Vanity Fair," "Gulliver's Travels," "The Raven and Other Poems," "Robinson Crusoe," with a black and white frontispiece of the hero garbed in goat-skins; "Tom Sawyer," autographed by Mark Twain in typically humorous vein for the little Christchurch girl to whom he presented the copy in 1895; Joseph Conrad's initial published work, the flyleaf bearing the naive comment: "My best remembered sensation about it is the perpetual surprise that I should be able to do it at all"; "An Inland Voyage," inscribed by Robert Louis Stevenson; and "Uncle Tom's Cabin," showing an engraving of the author, Harriet Beecher Stowe, her Puritan countenance framed by quantities of the most feminine-looking ringlets. A thin volume with a coloured paper cover, rather like a child's exercise book to look at, is one of the library's greatest treasures, for, in addition to several Latin elegies on the death of the scholar Edward King, it contains Milton's "Lycidas," this being the first appearance of the poem in print. Its monetary worth is estimated to be in the vicinity of £3000, and a similar value is placed on the first edition of Browning's "Pauline," which has a page of notes in the poet's handwriting.

Simple Things

These things give pleasure—simple things:
The flight of birds, the shade of trees,
Small wavelets whisp'ring on the shore,
Long grasses rippling in the breeze.

A baby's smile, a dog's caress,
The bleat of lambs on grassy hills;
All these sweet things have power to bless.
The simple heart with wonder fills.

At morning's glow and evening's light,
At starshine on a summer night,
At winter's storms and wind and rain—
For what were pleasure without pain?

A cosy fire, a pleasant book,
Music and flowers and simple food,
And those we love to share our nook—
These are the things that make life good!

—"E.W."

Ancient Writings

I was also shown a fragment of papyrus covered with Egyptian hieroglyphics dating back to 1000 years B.C. On the same shelf there were arranged reed books in vogue many centuries ago in Asia. A stylus was used to inscribe the characters on the smooth, flat surface of the reeds which were then strung together after the style of Venetian blinds. Curiously enough, the best specimen was brought in to the library by a man who found it among a bundle of Venetian blinds he had purchased at an auction sale. The oldest volume in the Turnbull collection is a mediaeval commentary concerning music, handwritten on vellum in 1150. The gilding and the clear reds and blues and greens of the illuminations are just as beautiful as when they were first completed. The binding, which was done in the 16th century, is of brown leather stamped with the initials J.B., one each side of a Tudor rose, for its owner was Dr. John Bull, Master of the Music in the Elizabethan Court, and composer of the melody which is the basis of Britain's National Anthem. Another lovely volume was a copy of D. G. Rossetti's poems, the cover material being embroidered with a mesh of gold thread and flowerets of rose and azure, the work of Miss E. Burden, sister-in-law of William Morris; and nearby was a pleasing example of tapestry binding from the Kelmscott Press, of which he was the founder. The series of bindings encasing the Katharine Mansfield collection have a particular appeal for New Zealanders; they are of scarlet morocco ornamented with golden kowhai blossoms and ferns, designed by Mr. Johannes Andersen, the first librarian. The fund for this purpose was given by her father, Sir Harold Beauchamp, as a memorial to his daughter.

I was very interested to see the first book printed in this country—a catechism translated into Maori by the Rev. W. Yate and printed at Kerikeri in August, 1830. Only one other copy is known to exist. Samples of bark cloths made by various Pacific peoples and collected by Captain Cook on his voyages formed a picturesque booklet. The log of his ship, "Endeavour," in which he sailed to these shores in 1769, was also on view. The entries are in copperplate script, presumably that of the first officer, Lieutenant Hicks, who refers to the Maoris as Indians.

The Queen's Dolls'-house

One of the volumes I took down from the shelves in the adjoining

ISSUED BY THE DEPT. OF HEALTH

CANCER

Early Treatment Essential

Cancer ranks second as the cause of death in N.Z. It stays high because we are not getting early treatment, while the cancer is still local.

WHERE DOES THE DELAY IN TREATMENT OCCUR?
Between the first symptom and the first visit to the doctor!

Approximately 80 out of 100 patients disregard the danger signals too long, either because they don't recognise them, or don't think they're serious enough, or want to carry on with their livelihood as long as possible before giving in.

Patients think that they cannot have cancer because any serious disease must be painful, and they have no pain—*cancer is painful only in its later spreading stages.*

Doctors help to reduce the cancer death rate by neglecting no known diagnostic procedure, and by persuading their patients to lose no time after diagnosis in getting adequate treatment.

EARLY TREATMENT DOES REDUCE THE DEATH RATE:

New Zealand Experience:

Cancer of the Womb—Successful treatments show 25% improvement, the bulk of this in treatment of early cases.

Cancer of the Breast—A little improvement in successful results but only when treatment is early.

Cancer of Stomach } Show no improvement in cures over the
" " Prostate } last ten years.

New Zealand Branch of British Empire Cancer Campaign warns us we are not reporting our cancers early enough to raise our proportion of cures.

American experience advises that the chances of effecting a cure are from 3 to 8 times greater, depending upon the site of the cancer, when adequate treatment is begun early in the disease, than when treatment is begun late.

REMEMBER THE DANGER SIGNALS:

- Any unusual lump or thickening, especially in the breast.
- Any irregular bleeding or discharge from any body opening.
- Any sore that does not heal—particularly about the tongue, mouth or lips.
- Persistent indigestion, often accompanied by loss of weight.
- Sudden changes in the form, colour or rate of growth of a mole or wart.
- Any persistent change from the normal habit or action of the bowels.

IMPORTANT: If in doubt, consult your family doctor first. He will advise you to visit the Clinic if necessary.

17a

FOR A HEALTHIER NATION

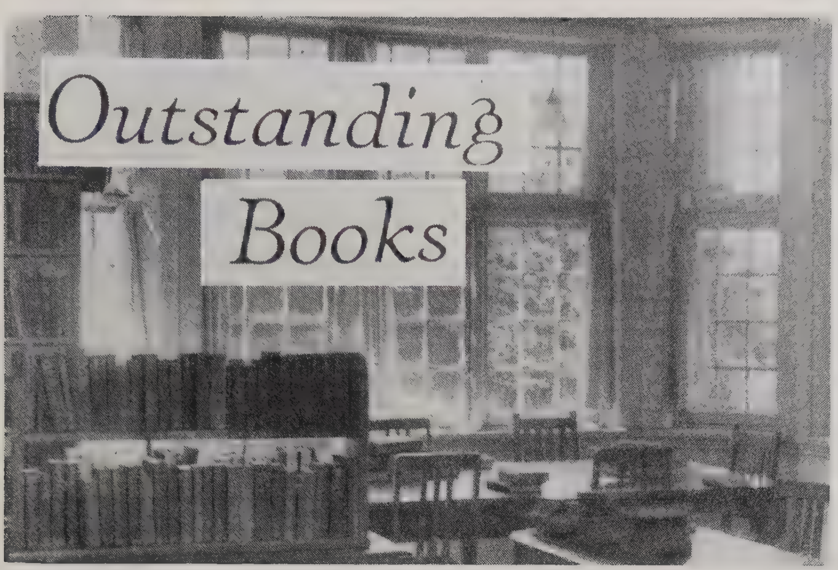
room had been presented by Queen Mary and inscribed by Her Majesty personally. The subject matter concerned the Queen's dolls'-house, and the different sections—architecture, furnishings, and objets d'art—were compiled by authorities. It was full of fascinating pictures, the reproductions of paintings by noted artists being the exact size of the originals (about 1in. by 1½in.). You would have loved the photographs of the royal nurseries with their marvellous toys and silver and applewood cradle, and the kitchens complete in every detail from vegetable bins and ½in. jars of jam and marmalade to hot and cold water and minute scrubbing brushes and bars of soap. The companion tome dealt with the contents of the library, to which the most famous authors of the day contributed, and gave facsimiles of the tiny pages of MSS. by such writers as Sir A. Quiller-Couch, A. E. Housman, Robt. Bridges, Rudyard Kipling, Gilbert Frankau, John Drinkwater, W. J. Locke, Laurence Binyon, Sir Henry Newbolt, A. S. M. Hutchinson, the New Zealander Hugh Walpole, and a host of others. There was even a cookery book with appropriate recipes for a royal banquet.

Another book which I found most entertaining was Iris Brooke's "English Costume in the Middle Ages," the period when lords and ladies went robed in cloth of gold and silver, figured satins, velvets and sables; when the masculine sex refused to be outdone by their wives in the matter of fantastic headgear and had "hats for every mood, and every man could let himself go in creating a model more exaggerated, more ornate, and more complicated in design than that of his neighbour." Present fashions are positively conservative compared to some of the styles portrayed within these pages!

I devoted the latter part of my time to the art treasures in the tall cabinet at the bend of the stairs. Here were "The Arabian Nights," Hans Andersen's "Fairy Tales," Shakespeare's "Tempest," and verse by Edgar Allan Poe, all illustrated by Edmund Dulac, and almost a full set of Arthur Rackham illustrations, each volume having an ivory-coloured binding and title-lettering of gold.

The books I have mentioned are but a fraction of the vast wealth of literature stored in this wonderful library. Carlyle says: "All that mankind has done, thought, gained, or been, it is lying as in magic preservation in the pages of books. They are the chosen possession of men." We in New Zealand are for ever indebted to that great book lover, Alexander Turnbull, whose generosity and vision made it possible for us to share in that possession.

Outstanding Books



Above.—A view of the reading-room, first floor, Alexander Turnbull Library, Wellington.

NEXT to the Bible, the volume which was mentioned most frequently in the many lists of outstanding books was Richard Llewellyn's "How Green Was My Valley." The "Oxford Book of Verse" held premier place among the various poetry anthologies; "Madame Curie," by Eve Curie, proved the favourite biography; and the most popular New Zealand book was Nelle Scanlan's "Pencarrow."

The prize-winning competitors were "Khorasbad," Marlborough, first; "S.J.M.," Hicks Bay, and "Eleanore," Auckland Province, second equal; "Pang," Auckland, and "M.P.G.," Gisborne, highly commended.

First Prize

TO make a selection of 15 from the many thousands of outstanding books in world literature is no easy task, but, at the risk of offending many of my old bedside favourites, here is my choice and some reasons for making each selection.

1. The Bible, because it is the inspired Word of God, and its precepts, language, and imagery are a source of inspiration for past, present, and future generations.

2. "Imitation of Christ," by Thomas a Kempis. A little book written long ago, but to which no one has ever turned without finding words of good counsel and encouragement.

3. Plays of William Shakespeare. These are the bedrock of our national literature.

4. "Henry Esmond," by William Thackeray. This perfect period piece of Queen Anne's day deserves prominent place among the great novels of the nineteenth century.

5. "The Oxford Book of English Verse." Between its covers is a treasure trove of the loveliest lyrics in our language.

6. "The Seven Pillars of Wisdom," by T. E. Lawrence. A volume which has already become a classic.

7. "The Ballad of the White Horse," by G. K. Chesterton. A stirring ballad in book form of the time when "the sea folk broke about our land, a Christless chivalry," and "there was not English armour left, nor any English thing, when Alfred came to Athelney to be an English king."

8. "The Worst Journey in the World," by Apsley Cherry-Garrad. This graphic, sensitively written account of Captain Scott's last expedition, told by one of his party, is more than a travel book, it is literature.

9. "Tarka the Otter," by Henry Williamson. Simply the life story of an otter, "his joyful water life and his death in the country of the Two Rivers," but distinguished by superb descriptions of Nature.

10. "Sparkenbroke," by Charles Morgan. A novel in the grand tradition: a modern classic, perfect in construction and style.

11. "The Flax of Dream," by Henry Williamson. Four-part novel describing a poet, Shelley-like in his life and tragic death.

12. "Winged Victory," by Victor Yeates. In the opinion of T. E. Lawrence this is the finest novel about the R.F.C. (1914-18 war) to be written.

13. and 14. "Kristin Lavernsdatter" and "The Master of Hestviken," by Sigrid Undset. Two brilliantly-written, dramatic sagas in novel form of life in thirteenth century Norway.

15. "The Road to En-Dor," by E. Jones. Truth which reads more strangely than fiction comprises this exciting story of two soldiers in a Turkish prison camp.—**"Khorasbad," Marlborough.**

Competitions

MAY

Don't forget that entries for the "PHOTOGRAPHIC CONTEST" close on May 15. Negatives to accompany each print if possible, also a description of the subject up to 100 words, and a stamped addressed envelope for return of photos.

JUNE

I was tidying my bookshelves the other day and I came across a volume which was one of my childhood favourites. The tale concerned three children and a tall stranger who wore flowing oriental robes and owned a Persian carpet. It looked very much like any other Persian rug in colouring and design, but it had one remarkable difference—it could fly over land and sea like a bird. You had only to sit down upon it, close your eyes, and wish, and hey presto! you were immediately transported through the air wherever you desired. As I turned the pages with their lavish illustrations of that much-travelled family exploring the bazaars of Baghdad, or learning how to paddle an Eskimo kayak, or walking beside the great wall of China, I began to ponder which part of the world I would most like to visit if I were fortunate enought to possess such a unique means of transport. I wonder what destination you would choose if the stranger suddenly appeared and offered you a trip on his magic carpet.

"IF I HAD A MAGIC CARPET—"

First prize 10/-, second prize 5/-. Closing date, June 15.

"MARY,"
C/o "Journal of Agriculture,"
Box 3004, Wellington.

Second Prize (Equal)

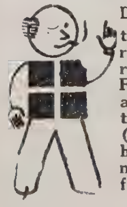
If it is a truism that "the world grows smaller every day," it is imperative that one half of the world should know how the other half lives. Many of the outstanding books of recent years provide excellent and varied fare suited to our needs in this respect. Detailed knowledge is served in digestible form. Of this type is "Scorched Earth," written by Edgar Snow—a graphic, intensely exciting book depicting the everyday life of Chinese peasants in their unceasing struggle against the Japanese and their heroic efforts towards the reconstruction of their desecrated countryside.

Cedric Belfrage is another powerful writer whose novels contain an urgent social message. "Let My People Go" deals with economic, religious, and racial conflicts in U.S.A. The reader is jubilant or depressed according to the success or failure of the minister's varied projects to alleviate misery. Another interesting book, though of a different type, is Webb Miller's "I Found No Peace." It tells of a journalist's travels after the Great War. It is full of dramatic adventure and describes the Spanish conflict, also the war in China, and elsewhere. Nor is peace to be found in George Orwell's "Down and Out in Paris and London," which is a gripping account of tragedy, poverty, and human misery in the two great cities.

A PRICELESS GIFT

— to —

PRISONERS of WAR



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"The Grey Wolf," by H. C. Armstrong, is an outstanding biography, Mustapha Kemal is the strong, ruthless dictator of modern Turkey, and his biography is as forcible as the man who inspired it.

For quieter moods Daniel Vare and Ernest Bramah are delightful. Vare, as the "Laughing Diplomat," takes us on a rollicking pre-war tour of half the gay capitals of Europe. "Kai Lung's Golden Hours" and other Kai Lung volumes are Bramah's contribution, written in quaint language and gently satiric in tone.

New Zealand books are also worthy of inclusion, particularly "Islands of Danger," by Ernest Beaglehole, a book recently published in this country. It is a review of social life and marital customs among the Pacific Islanders. There are many fine descriptive passages and much quiet humour. "A Man and His Wife" is a collection of short stories mostly concerned with everyday life in New Zealand. It was written by the versatile Frank Sargeson. F. L. Combs is a capable essayist and his new book, "Half Lengths," is also of outstanding merit. "Notes from a Backblocks Hospital," in which Dr. Smith, of Rawene, conveys a great deal of knowledge on medical topics, provides laymen with much food for thought. Another important medical book is "War Against Disease," which explains in simple language the most remarkable discoveries in the scientific world during the past decade.

Two plays conclude this list: "Waiting for Lefty," by Clifford Odets, which is extremely well done, but tends to leave the reader feeling depressed, and "Distant Point," the famous Soviet play.—**"S.J.M.," Hicks Bay.**

Second Prize (Equal)

"Madame Curie" (Eve Curie). The story of a genius and a life of unselfish devotion to the cause of medical science.

"The Life of Ellen Terry"—partly autobiography. The story of a gifted and lovable woman.

"Reaching for the Stars" (Nora Waln). A book written about Germany before the war. A sincere and unprejudiced account.

"So Perish the Roses" (Neil Bell). The life of Charles and Mary Lamb in story form. A faithful record of the gentle "Elia," who was patient in adversity.

"Haworth Parsonage" (Isabel Clarke). A moving and understanding study of the Bronte sisters.

"Red Surgeon" (George Borodin). A picture of a Russian surgeon's work amidst the inhumanity of war. Well written, without bitterness.

"Precious Bane" (Mary Webb). A book I can read again and again and yet always find in it something more in which to delight.

"The Yearling" (Margaret Rawlings). In addition to the tale of the boy and his pet, the descriptions of pioneering days in America are full of interest.

"The Little Karoo" (Pauline Smith). South African stories beautifully told.

"Winter Solstice," which tells of a young girl who, because of an unhappy childhood and an accident, remains an invalid for nine years. The setting is bleak, but realistic, and her recovery and subsequent problems are a piece of real life.

"The Splendid Fairing" (Constance Holme). Like her other novels, this story concerns that stretch of Westmorland which runs from the Pennines to the sea. It is also a story of one woman's hatred of another—a just hatred, but one which ends in tragedy.

"Quietly My Captain Waits" (Evelyn Eaton). Based on historical facts and depicting the people of Novia Scotia during the time it was a French possession.

"Musk and Amber" (A. E. W. Mason). Thrills and adventure, written with a romantic flavour.

"Combined Operations" (the official story of the Commandos). An unemotional record of heroism, humour, and skill, telling of failures as well as successes.

"The Golden Treasury of Songs and Lyrics."

What treasures books are. I feel that if you like a book specially, you should be able to give other book-lovers an idea of the quality of the contents—the reason **why** it is one you love.—**"Eleanore," Auckland Province.**

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One of our greatest poets, Milton, has said: "A Good Book is the precious life-blood of a master-spirit."

—"Pan," King Country.

The Treatment of Cancer

Contributed by
The Department of Health

IF cancer in its early stages caused half as much pain as toothache, the present terrible death-roll from this disease would be considerably reduced. The tragedy of cancer lies in the fact that it develops slowly and painlessly, and the victim is not made forcibly aware of it until the pain strikes him. Then it is usually too late to do anything.

Danger Signs

There are, however, certain danger signs that are visible when the cancer is in the curable stage. It may be a lump, or a wart, or a mole, or a sore that won't heal. Internal irregularities such as discharges, or any changes in normal bowel action may indicate cancer formation. On the other hand, any of these signs may be perfectly harmless. But they should make you suspicious, and if you carry your suspicions to your doctor, he will give you a frank answer. If it isn't cancer, he'll set your mind at rest; if he thinks it is cancer, he'll take the necessary steps to kill it.

Cancer can be cured if it is attended to early enough. This is one of the most important messages the medical profession must get to the people. Cancer in its early forms is curable. If people appreciate this, they will go to their doctors at a time when disaster can be averted. Further than this, they should know that there is no phase of disease affecting man which is under more careful or more thorough investigation. And when science knows how to cure cancer by some specific method it will be broadcast throughout the world immediately. In the meantime credulous people should beware of the quack who guarantees a magic cure. There is no such thing.

Not Contagious or Hereditary

Now, what does science know about cancer? Well, it does know that it is not contagious—it is not a germ disease like pneumonia or tuberculosis—and that, in itself, it is not hereditary except in certain rare cases. Those two facts are of the utmost importance to the lay public, and should dispel much misdirected thinking. Another thing science has proved about cancer is that it can be produced by chronic irritation. Repeated injury at the same spot over a long period of time does play a definite part in the production of cancer. Experimentally cancers have been produced in animals by the repeated injection of a chemical irritant, or by painting an irritant such as tar repeatedly on the skin.

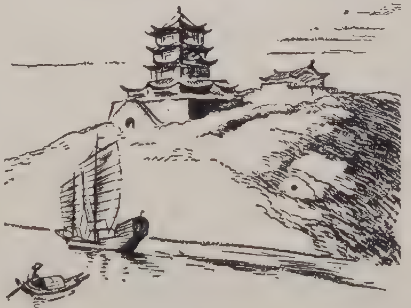
Chronic irritation, however, does not necessarily mean injury by force. It might be that the juices which digest the food are a source of irritation, or it might be chronic irritation due to bacteria or parasites; or perhaps the exposure of tissues used to a certain environment; or to chemical irritants produced elsewhere in the body than in the tissues themselves. But, even beyond irritation, there must lie another cause, and it is this unknown factor for which science is busily probing.

It will be seen, then, that cancer is a complex disease, requiring drastic measures. The attack must be made early. By getting medical advice without delay, people with lumps, ulcers, signs of irritation, and other suspicious symptoms may save themselves untold distress.

Clinics Established

It's an unfortunate and very significant fact that deaths from cancer in New Zealand are on the increase. For instance, from 1939 to 1943 the death rate per 10,000 of our population rose from 11.79 to 14.24, and next to heart disease cancer is the principal cause of death. Early attention will keep that curve from rising. To help in reducing the incidence of this dread disease clinics have been established at each of the four main centres, and here the best possible specialist advice is available free. Already they have recorded a steady improvement in the number of successful treatments. They're there to serve you. If you have anything to feel suspicious about, consult your family doctor first. He will advise you to visit the clinic if necessary. You'll never regret it.

"Made in China"



LIN Yutang, one of China's most noted men of letters, has written the foreword to Cornelia Spencer's "Made in China," a recent publication encompassing within the space of a single volume a record of Chinese achievement in art, music, poetry, drama, medicine, architecture, and commerce—in short, a history of China itself. "For China is a land of artists, who use the very soil they till to produce pottery and porcelain; whose very writing is itself an art; whose words express the most profound truth and sensitive wisdom; who can make something from nothing and have that something beautiful; who can lose bitterly and not be beaten. They are artists, and the artist's soul can never stop interpreting and dreaming and creating."

The author's style is colourful, concise, and informative. Whatever her subject, whether she is describing ancient dynasties or present-day industrial co-operatives instituted by the New Zealander, Rewi Alley; the legendary origins of silk and jade or the technical processes of cloisonné and ink and lacquer manufacture, she has the gift of making it interesting to the reader. The chapters on calligraphy, landscape gardening, and T'ang sculpture are particularly good examples of her descriptive ability. The text throughout is admirably illustrated with black and white drawings by Kurt Wiese, and there are also coloured plates depicting fine porcelains, bronze, enamel, and other choice examples of Chinese craftsmanship. "To China we are indebted for the beginning of man's expression of beauty . . . for the robust appreciation of living and thinking . . . for the beginning of medicine and printing and astronomy. To China we are indebted for the roots of democracy."

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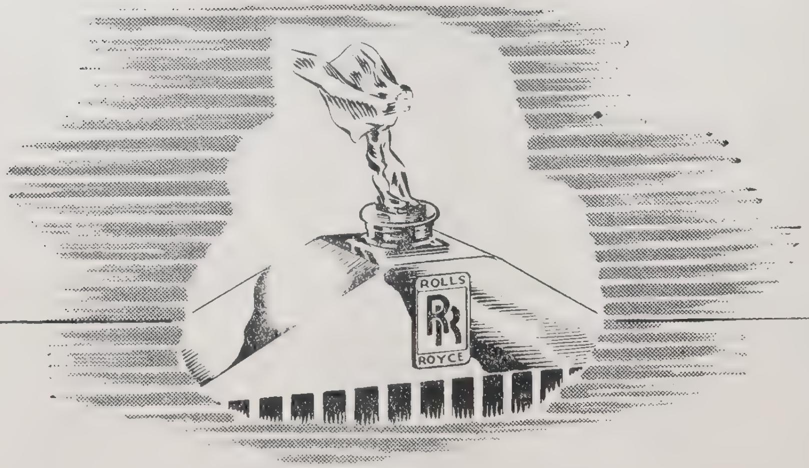
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Mary's at - Home -

GARDENING! It has a fascination for me that outshines backaches and broken fingernails! And because I love them my plants do seem to have a happy knack of responding with the greatest of zest. Perhaps because I delight in it so, I've been able to make beauty blossom so often where I found wilderness. It's been the greatest fun beginning from scrub, fern, and stumpy ground, and gradually building out of it the kind of loveliness I've pictured in my mind, and preserving any natural beauty and blending it in with my own ideas while my garden grows. Tidying paths and trimming lawns have spelt many an hour's hard work, yet how pleased I've been to look over my work and how I've prided myself that it has really become a lovely spot on God's green earth. Tucking in my lettuces firmly so they'll feel secure and grow happily, puddling in my cabbage plants, staking tomatoes have all been included in my gardening. And if you love doing a thing, you know you'll do it well and take pride in the achievement.—**"Tiggety Boo."**

MY garden is very gay just now, and I've had some beautiful lilies. I took first prize with them at our local show recently.—**"Vista."**

MAY I join your At Home? I do enjoy the pages so much and I think the competitions are splendid. I find myself planning my contribution as I do my dishes, washing, and other everyday tasks, instead of worrying over all the work which has to be done. I find much more beauty and gladness in my life than ever before. —**"Violet Ann."**

PLAYING accompaniments is a task I always love, especially if it is a kindred spirit for whom I am playing. Unfortunately, just when I am really warmed up to things, along comes some bright soul with an impossible modern song—I'm bumped back to earth with a crash, and I long for such favourites as "Jerusalem," "The Floral Dance," or even "Three Blind Mice"!—**"Anne Margaret."**

MY children are an ever present incentive to me to attempt any new undertaking which appears to be for their good. Whenever I am troubled and depressed I have only to see my children, vigorously happy in their funny little sayings and doings, and at once I feel uplifted to know that they are well and contented. It is a lasting token of the love and faith which carried me through the difficult early years of their babyhood in the isolated surroundings of the back country.—**"Constantia."**

LETTERS have always been very precious to me, but now that we live in the country they are doubly precious. They are almost as good as having a friend pop in for a cup of tea and a chat! They certainly add light to the day.—**"Tinkle Tinkle."**

WHEN I feel blue I start a piece of needlework and I find happiness in choosing the colours and pleasure in the results of the work itself. Even in these busy days when we usually spend all our spare moments knitting for the forces and our families, it is worth taking a little time to maintain the "home beautiful."

—**"Mel," Whakatane.**

THE MENS WEAR STORES

Hallensteins

H.B. QUALITY IS DOUBLY IMPORTANT TO-DAY

Green and Pleasant Land

THERE are some lovely little by-passes, bays, country districts, and quiet rural spots in New Zealand, just the right places for a holiday and still quite unspoilt and unsung. The recent disastrous flood recalls such a pleasant place, a little off the beaten track of the tourist, where I jaunted in a happy leisurely fashion.

To get the keenest enjoyment from a holiday you need the right mood, and, in these days, the feeling that you have deserved the rest from the unusual round of wartime duties. What a relief to cast off all responsibility, and to amble through the countryside. With no petrol a private car is out of the question, but even in rural New Zealand the bus service has so improved that one need not be afraid of being stranded, dependent, as a last resort, on the paper delivery van or a passing cream lorry.

Taking the bus from Orari, I passed through one of the most delightful spots in South Canterbury, the district round Geraldine. Green rolling downs, browsing cattle and sheep, a freshness of leaf and field that soothes the tired city spirit. There lovely trees adorn the landscape—great horse-chestnuts—massive and leafy, but lightened by their little candles, and nearby sweet-scented limes. The bus passes by groups of trees and crosses water races sprayed out over the road like dulled silver.

The presence of kowhai and an all too infrequent cabbage tree reminds us that these others are foreign to the country and without the appeal of "our bush." But when we consider the barren stony plain on which this leafy paradise has been made we can do nothing but bless those first pioneers, who translated the trees of their native country and who have created this beautiful spot—turned it into green cultivated fields, adorned it with beautiful trees, and added the slow rhythm of country life, the ploughing, the sowing, the harvest, the quietly browsing cattle, sheep and horses.

From Geraldine the bus drive through Temuka brings us to the pretty seaside resort of Timaru. But the country for me! I take the Fairlie train. This train is one of these friendly country trains where the guard knows everyone in the district. He remembers to put out at some little wayside station the medicine for

Mrs. Smith's or Mrs. Brown's baby. He exchanges country news with the travellers. Across the plains jolts the train while I admire the crops on either hand. We rise slowly all the time to the foothills of the mighty Alps. We pass through leafy Pleasant Point and come to Cave.

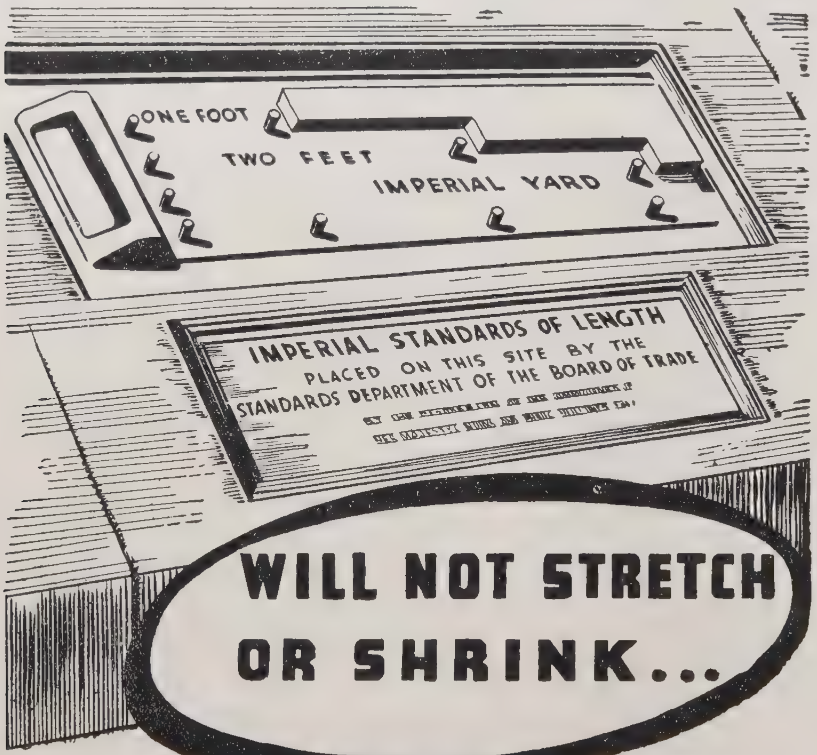
The creamy buffs cut by the river tempt me from the train, and I make my way on foot up a steep road on the north bank of the river; the road winds up a devil's elbow or two, where hazels grow in the gullies, and so comes to the plateau above. There I spend the rest of the day dreaming in a garden and gazing at the view. North and west of me lies the beautiful Totara Valley, with its gentle sweep to the hills. There are trees, cultivated lands, and farmhouses peeping from their shelter belts of dark pines. To the south east the Pareora makes its winding way to the sea, while to the east lies the most glorious panorama the eye could wish to behold. It is certainly beyond me to describe adequately the rolling downs, the farmlands, the districts of Geraldine and Temuka, the country round Timaru spread out before me, and there in the distance a faint magic line of blue, the Pacific Ocean.

From Cave the train begins a steady rise alongside the swift little mountain-fed river to Fairlie. From Fairlie I take the bus once more and travel back to Timaru by way of the Pareora Gorge. There is much unbridged water on the road, and the crops are ominously green for January; the bright green starred with blue of lucerne, the graceful oats, while the vigorous wheat is just running into ear.

Passing over the Cave hill, with its tricky devil's elbow, we descend into the valley again. There where in years past was once a mere unbridged creek bed I now see water running bridge high, scouring out the precious soil as it goes, and I wonder what can have happened in the back country to change the face of the plains. Here my feelings about the pioneers begin to waver. Perhaps they have been guilty of denuding the land of its natural forest, have caused either through greed or ignorance the floods, the soil scourings, the ruin that we see. Vague thoughts of disaster float disturbingly through my mind and distract my attention from the scenery, which as we descend into the gorge grows wilder and more magnificent.

The river has carved out a deep bed and is still scouring round the steep sides of a dominating bluff. Where the bluff does not overhang the river, but slopes up, it is covered by shrubby vegetation, manuka, rangiora, koromiko. Lovely names! I say them over softly, until a fellow-passenger's uneasy glances pull me up! We climb up and up and finally leave the gorge, coming out on the downs south of Timaru. The trip is over. My valley was green indeed, but now perhaps is covered with the scum, the debris, the stones left by receding flood waters.—**"F.J.B.," Wellington.**

When a man lives with God his voice shall be as sweet as the murmur of the brook and the rustle of the corn.
—Emerson.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Wholemeal Recipes

IT is essential to have a generous proportion of vitamin B in our diet if we are to maintain sound nerves, a healthy appetite, and resistance to infection. This vitamin is found in meat, nuts, legumes, yeast, potatoes, milk, egg-yolks, and whole grains. Wholemeal, or wheatmeal, is a particularly rich source of vitamin B, for it is contained principally in the outer husk of the wheat—the bran and pollard. The interior of the grain contains starch or white flour, which is deficient in mineral salts.

The wise housewife, therefore, will see to it that she introduces as much wholemeal into her cooking as possible.

In bread, scones and biscuits; in porridge, cakes and puddings wholemeal can be used to advantage, and even in such items as sponges and pastry wholemeal can be substituted successfully for white flour. It is also suitable for thickening soups and stews, and for coating fish or cutlets before frying.

Adults, as well as growing children, gain considerable benefit from the health-giving properties of wholemeal as a staple article of diet. The accompanying recipes show how to include wholemeal in everyday fare:—

WHOLEMEAL BREAD.

3 cups wholemeal, 2½ teaspoons baking powder, ½ teaspoon baking soda, ¾ teaspoon salt, 1 tablespoon golden syrup, 2 teaspoons raw sugar, 1 cup milk.

Mix the dry ingredients together and stir in the golden syrup and milk. Add a little more milk if the mixture seems too stiff. Bake in a large tin for one hour. This mixture is sufficient to fill three baking powder tins, which require only 35 minutes baking time.

FRUIT AND NUT LOAF.

2 cups wholemeal, 2 cups bran, 1 cup flour, 2oz. butter, 2oz. lard, 2oz. raw sugar, ½ teaspoon salt, 2 teaspoons baking soda, 1 teaspoon mixed spice, 1 egg, 1¼ cups milk, 1 cup raisins or sultanas, ½ cup walnuts.

Sift the flour and baking soda, add the wholemeal, bran, salt, spice, and sugar, then the egg well beaten and the milk. Melt the butter and lard, and lastly stir in the fruit and chopped walnuts. If a large tin is used, bake for 2 hours in a moderate oven; if two smaller tins are used, cook 1 hour.

APPLE SCONES.

8oz. wholemeal, 2oz. butter, 1oz. lard or dripping, 1 egg, 1 teaspoon baking powder, 2oz. sugar, 1 or 2 tablespoons milk, stewed apples.

Cream the butter, lard and sugar, then add the dry ingredients. Stir in the beaten egg, also the milk, then roll out the mixture on floured greaseproof paper. Spread stewed apples on one half and fold the other half over and remove the paper. Cut into sections and bake in a hot oven for 15 minutes.

WHOLEMEAL GEMS.

¼lb. wholemeal, 2oz. flour, 1½ teaspoons baking powder, 1oz. sugar, 1oz. butter, ¼ teaspoon salt, 1 egg, ⅓ cup milk.

Cream the butter and sugar, beat in the egg, add the milk, and lastly, stir in the dry ingredients. Cook in well-buttered gem irons.

WHOLEMEAL TART.

1 cup wholemeal, 3oz. butter or dripping, 1 teaspoon baking powder, pinch salt, water to mix (a little raw sugar may be included if desired), jam, and golden syrup for fillings.

Rub the butter or dripping into the wholemeal, add the salt and baking powder, and mix to a stiff consistency with water. This amount of pastry is sufficient to line two pie plates. Use jam for one filling and golden syrup sprinkled with fine oatmeal for the other.

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STEAMED SULTANA PUDDING.

4oz. wholemeal, 4oz. brown breadcrumbs, 2oz. butter, 2oz. lard, 1 egg, 1 cup sultanas, 2oz. raw sugar, chopped mixed peel, ½ teaspoon cinnamon, teaspoon nutmeg, milk to mix.

Rub the butter and lard into the wholemeal and breadcrumbs, add the sugar, cinnamon, nutmeg, sultanas, and peel, then stir in the beaten egg and a little milk. Put into a buttered basin and steam 2 hours.

BRAN BISCUITS.

1 level cup wholemeal, 1 heaped cup bran, 1 teaspoon baking powder, 3oz. sugar, ¼lb. butter, 1 egg, 1 teaspoon mixed spice (optional), pinch of salt.

Beat butter and sugar to a cream, add syrup (if used), beaten egg, then dry ingredients previously mixed. Roll out thinly, using bran on the board. Put on cold greased tray and bake in a moderate oven for about 15 minutes. (1 dessertspoon golden syrup may be added, in which case use a little less sugar).

WHOLEMEAL SPONGE.

1 cup wholemeal, ¾ cup sugar, 3 eggs, 3 tablespoons milk, 2 tablespoons butter, 1 teaspoon baking soda, 1 teaspoon cream of tartar.

Beat the eggs and sugar together thoroughly, then add the wholemeal and baking soda. Warm the milk and melt the butter in it, then stir this into the mixture. Bake in a fairly quick oven for 20 minutes.

CURRANT COOKIES.

1 cup wholemeal, 2oz. currants, 2oz. butter, 2oz. raw sugar, milk.

Rub the butter into the flour, add the currants and sugar, and mix to a stiff dough with milk. Turn on to a floured board and roll out. Cut into rounds and bake in a quick oven 10 minutes.

HEALTH CAKE.

3oz. butter, 1 egg, 8oz. wholemeal, 3oz. raw sugar, ¾ cup milk, 1 teaspoon nutmeg, 1 cup sultanas, 1oz. lemon peel.

Cream the butter and sugar, then stir in the milk and beaten egg. Lastly add the wholemeal, nutmeg, and fruit. Cook in a moderate oven about 45 minutes. When cool ice and sprinkle with chopped walnuts.

WHOLEMEAL CHOCOLATE CAKE.

2 cups wholemeal, 1½ cups flour, 1oz. cocoa, vanilla essence, 1½ teaspoons baking soda, 1½ cups milk, 2oz. butter, 2oz. lard or dripping, 3 tablespoons golden syrup, 8oz. raw sugar, 1 cup chopped nuts and dates or raisins (optional).

Warm the butter and lard, golden syrup, sugar, and 1 cup of the milk, together. Mix the dry ingredients together, add the warm mixture, vanilla flavouring (nuts and fruit if desired), and lastly the soda dissolved in the remainder of the milk. Beat well together and turn into a greased cake tin (large size) and bake 1½ hours in a moderate oven.

WHOLEMEAL GINGERBREAD.

8oz. wholemeal, 8oz. oatmeal, 2oz. butter, 2oz. lard, 4oz. sugar, 1 teaspoon baking powder, 1 teaspoon ground ginger, 1 teaspoon mixed spice, 4 tablespoons golden syrup, 1 teaspoon baking soda, 1 cup milk.

Warm the butter, dripping, sugar, and syrup together, add the soda dissolved in the milk, and then all the dry ingredients. Mix well, then cook in a steady oven for 50-60 minutes.

SAVOURY BISCUITS.

1 cup wholemeal, 4oz. grated cheese, 2oz. butter, 1 teaspoon meat extract, ½ teaspoon salt, milk and water to mix.

Rub the butter into the wholemeal, add the salt and grated cheese. Melt the meat extract in a little warm milk and water, and mix with the other ingredients to a stiff dough. Roll out thinly, cut into fingers, and bake in a moderate oven 12-15 minutes.

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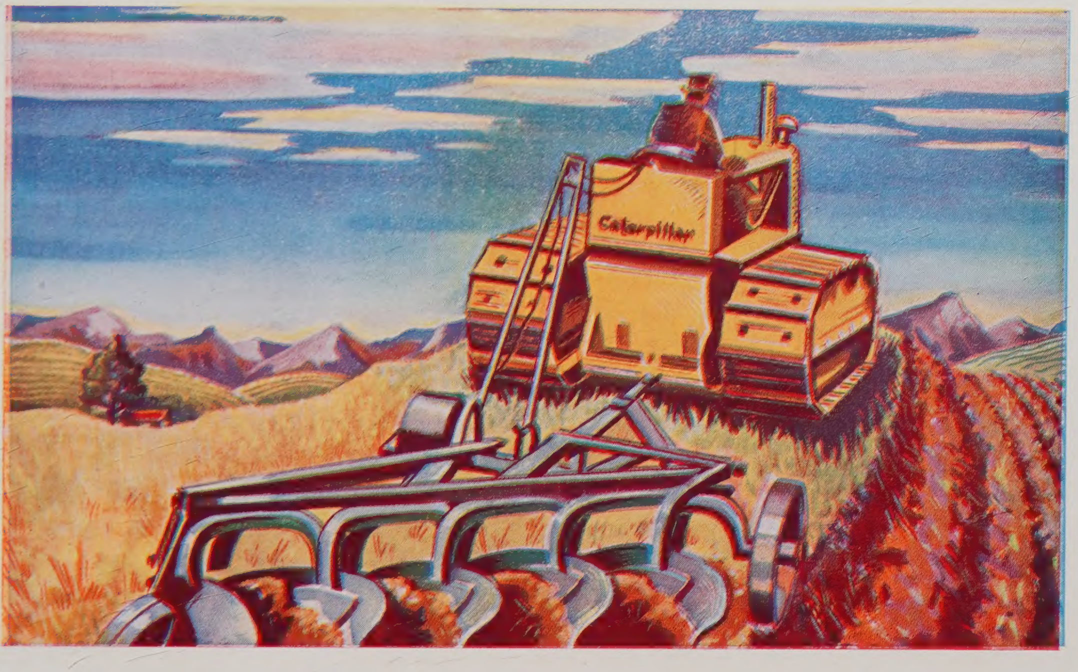

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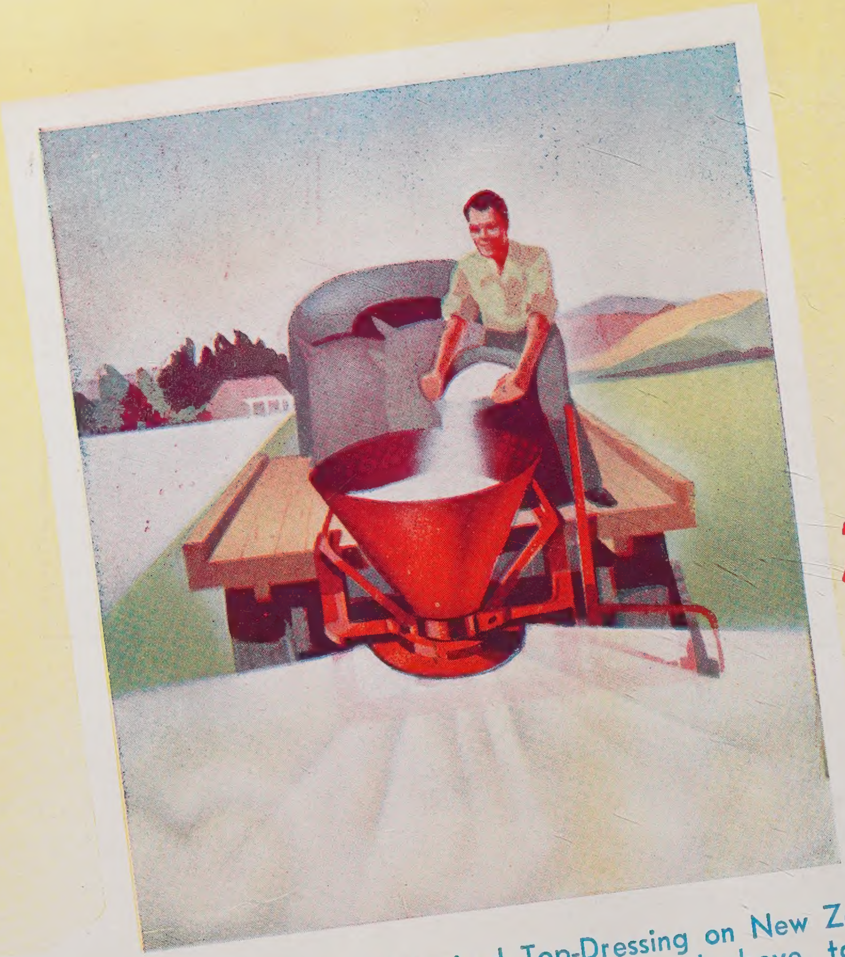


TOP SPEED in TOPDRESSING

With a Horwood Rotary Top - Dresser you can spread evenly over a 40ft. width.

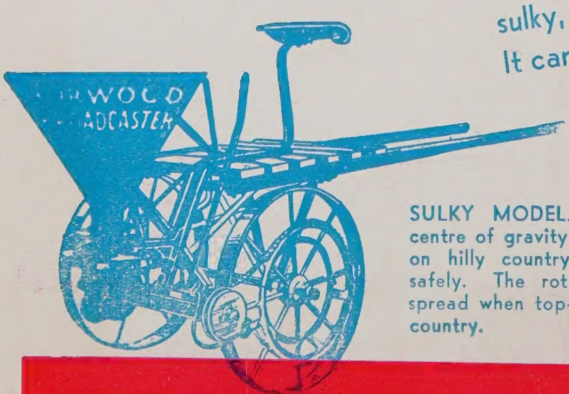
The Horwood has revolutionised Top-Dressing on New Zealand Farms and it is possible with the Motor Truck Model, illustrated above, to top-dress up to 250 acres in one day.

The Horwood is simple to operate and easy to adjust. (No cogs to change).

The spreading action makes it unnecesary to drive close to stumps or fences.

The Horwood is interchangeable and can be mounted on sulky, motor-truck, dray, konaki, or tractor-drawn trailer.

It can be driven through narrow gateways without uncoupling.



SULKY MODEL. 5½ft. wide, has a low centre of gravity and can therefore be used on hilly country, both satisfactorily and safely. The rotary action gives an even spread when top-dressing on hilly or broken country.

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HORWOOD Rotary TOPDRESSER